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January 1988
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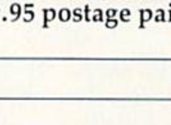

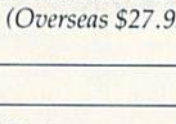

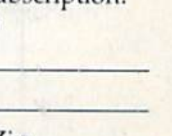

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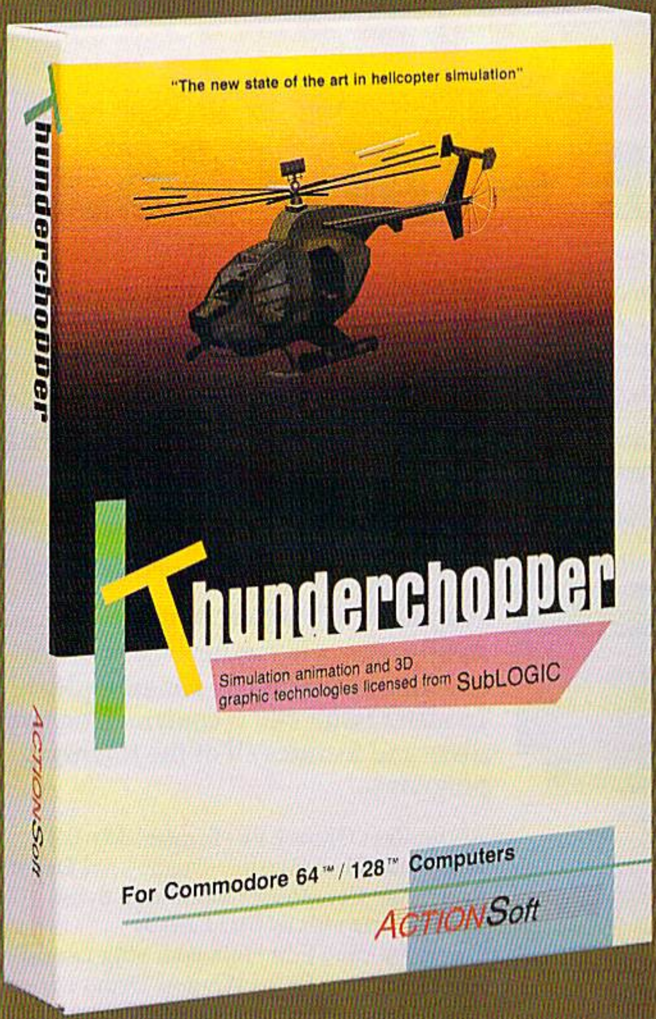
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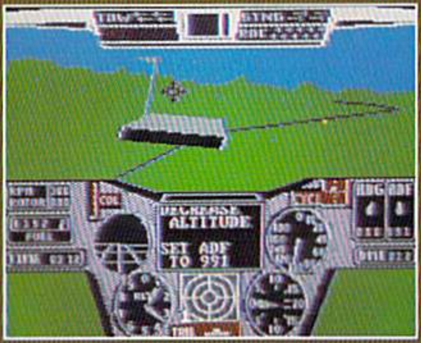
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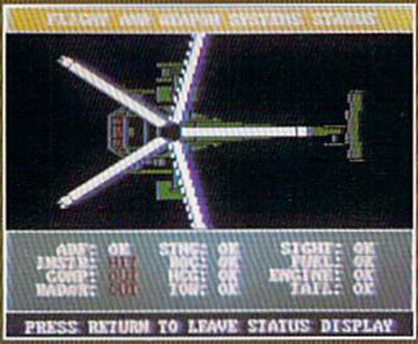
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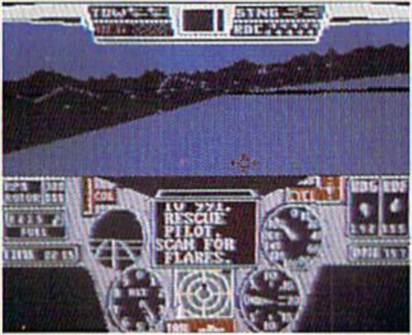
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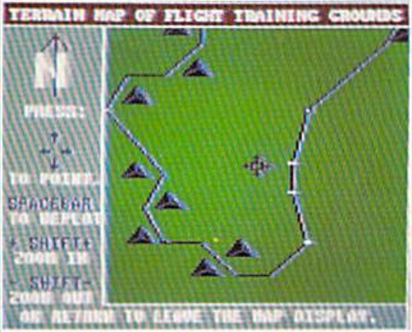
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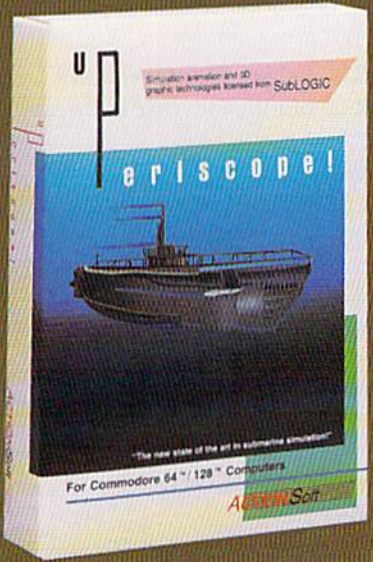
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RUN

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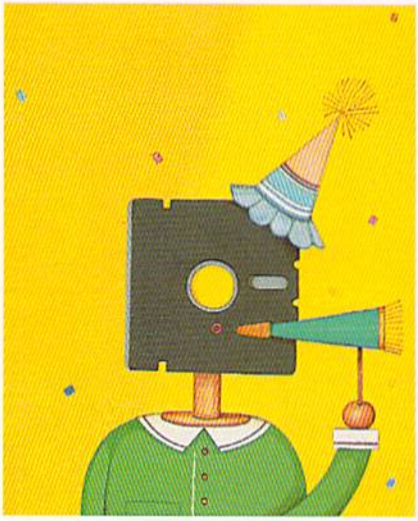

COVER ILLUSTRATION BY STEVEN RYDBERG

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Short but useful applications for your Commodore computer. You can have a 1988 calendar in every room, thanks to your Commodore and our Calendar Maker program.

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With our brand new checksum program—the same one serves for both the C-64 and the C-128—you can type in *RUN* listings more easily and accurately than ever.

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* THIS ARTICLE CONTAINS A PROGRAM LISTING. THE PROGRAM IS ALSO AVAILABLE ON THE JANUARY-FEBRUARY 1988 RERUN DISK. TO ORDER, USE THE CARD BETWEEN PAGES 80 AND 81.

† SEE RUNNING RUMINATIONS, ON PAGE 8, FOR AN EXPLANATION OF THE LISTING FORMAT USED IN THESE ARTICLES.

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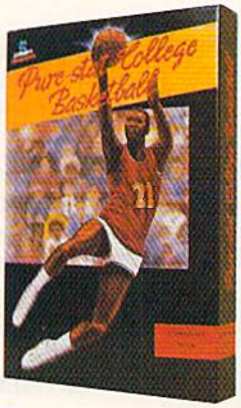

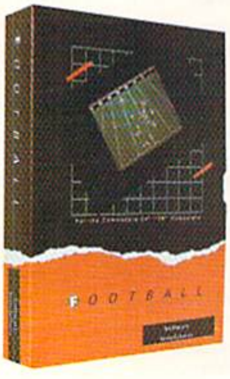

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RUNNING RUMINATIONS

A look back and a look ahead, as RUN *enters its fifth year.*

SALUTE THE PAST, RING IN THE NEW

As we begin a new year, it's a good opportunity to rededicate ourselves to our editorial mission of providing our readers with the most useful coverage of the Commodore marketplace.

To that effect, we have implemented in this issue some changes in staffing and assignments.

Jim Strasma, who has authored *RUN*'s popular Commodore Clinic column since its inception in January 1984, has stepped down from that position. Job responsibilities as PC Lab Manager at Western Illinois University have necessitated this move for Jim, who, as most of you know, was an early pioneer in the Commodore/PET market.

We've enjoyed working with Jim over the last four years and have learned a lot from him. His encyclopedic knowledge of Commodore companies and products was instrumental in establishing Commodore Clinic as one of the most-read columns in the magazine. In his four years with *RUN*, we conservatively estimate that he has answered over 1000 questions through his column—and many more over the phone and through his correspondence with readers.

While we're sad to see him go, we're enthused by the prospect of our own Lou Wallace taking over the column. So readers each month can continue to expect the same insightful and informational answers to their questions and comments.

Beginning with this issue, *RUN*'s Magic column is also experiencing a changing of the guard. *RUN*'s technical editor, Tim Walsh, will be taking over the column for Jim Borden, who will continue to lend his programming expertise to the magazine.

We view these as positive changes that will strengthen the magazine.

Also at this time, we announce a format change in our educational coverage. Beginning with this issue, *RUN* will discontinue publishing the monthly Resource Center column. We will be incorporating our educational coverage in the magazine proper.

Through her column, Associate Editor Margaret Morabito has provided Commodore 64 and 128 owners one-of-a-kind coverage of the Commodore education market, and has subsequently built up quite a following as champion of educational applications for Commodores. She is now writing a book that explores this topic.

We extend our appreciation to Jim, Margie and Jim for their roles as columnists in the magazine and wish them well in their future endeavors. We assure our readers that they can expect the same quality coverage they have become accustomed to as we enter 1988, our fifth year of publication.

ATTENTION, READERS

This issue features two "blockbuster" programs—*RUN*'s Memo Book and RUN Term 128—that are exceedingly powerful machine language programs with (especially in the case of RUN Term 128) quite long listings.

Because of the length of the machine code, we had to consider several ways of generating listings that could be typed in by our readers.

We considered three main techniques. The first was to use the tried-and-true method of converting the binary files to Basic Data statements consisting of numbers in decimal format (0–255) separated by commas, like this:

```
100 DATA 12,76,34,231,19,45,255,0,64,19
```

One of the benefits of a Basic Data statement format is that you can use *RUN*'s Checksum program to make sure you enter the lines correctly. But, in the case of RUN Term 128, this technique would have resulted in a type-in listing of nearly 14 pages!

A second format would involve a special ML entry program that converts the binary files to a hexadecimal format of 11 pairs of digits. Line numbers and commas are not used, but a space occurs between each pair of digits. It looks like this:

```
0000 A1 34 FF 23 C5 9A DF 5F B4 98 C0
```

Compared to the decimal method described first, this is a more condensed method of presenting the data, but it still would occupy about 10 pages for the RUN Term 128 listing. And, unfortunately, it would also require your typing in a special ML entry program, in itself over two magazine pages long. That means you'd need *RUN*'s Checksum program to type in the ML entry program, which you'd then use to enter the hex data shown above. All in all, you'd have to enter well over a dozen pages for RUN Term 128 using this technique.

The third method is also a hex entry technique, but it's a combination of the two described above. It uses Basic Data statements like the first, but has hex data like the second. The data is presented with more information on a line, and looks like this:

```
100 DATA A23456DE45 F02376C5AA E3F7
```

As you can see, this looks somewhat more cryptic, but has the advantage of being the most condensed form (in the case of RUN Term 128, it's a little over seven pages). It can also be used with *RUN*'s Checksum program.

After a great deal of discussion, testing and measuring, we opted to use this last method for these long, machine language programs. There are two advantages for you, the reader. One, you type in fewer lines; two, it frees up pages for other programs and articles, so we can bring you more per issue.

In discussing the various merits of the different techniques, we questioned whether readers want these very powerful, commercial-quality programs (RUN Term 128, RUN Script, and so on) that require a lot of typing, or would prefer several smaller programs instead? Obviously, the programs that offer the most contain the longest listings.

We'll be bringing you some super 64/128 programs in the coming year. Let us know the kinds of programs you prefer and how you want us to format the listings. Send your comments to: *RUN* Editors, 80 Elm St., Peterborough, NH 03458.

—***RUN* Editors**

FEEL THE HEAT
the SENTRY
FIREBIRD
APPLE IIc/IIe/IIe
ELITE
FIREBIRD
STARGLIDER
RAINBIRD
The GUILD of THIEVES
By Magnetic Scrolls
RAINBIRD
THE ADVANCED OCP ART STUDIO
RAINBIRD

No matter what kind of game you're in the mood for, you'll find that if it's in a box marked FIREBIRD, it's really hot!

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Look for the Firebird — it stands for top-quality software in virtually *every* category.

How About This Ball of Fire From Firebird!

This is SENTRY, a unique Strategy game with over 10,000 full-color 3D vector landscapes and four-way scrolling. Do you have truly exceptional concentration and near perfect hand/eye coordination? Then maybe — just maybe — you possess the skill to outwit the Sentry at each level of the extraordinary challenge.

Firebird Fireworks Unlimited

When your mood shifts from the deliberation of strategic planning to the excitement of fast-paced Arcade action, look for Firebird's ELITE, a unique game which encompasses the best of both worlds. Or try STARGLIDER, an amazing 3D combat flight simulation.

If it's Adventure you're after, here's the breathtakingly illustrated GUILD OF THIEVES, with its revolutionary text-handling system.

Firebird even offers economical, professional-quality Productivity software! ADVANCED ART STUDIO is a comprehensive art package with powerful graphics routines.

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Firebird software for Commodore 64 systems, including the popular Golden Path, Pawn, Colossus Chess IV, Cholo, Talking Teacher, Concise Music System and Advanced Music System, is available from $24.95 to $59.95.

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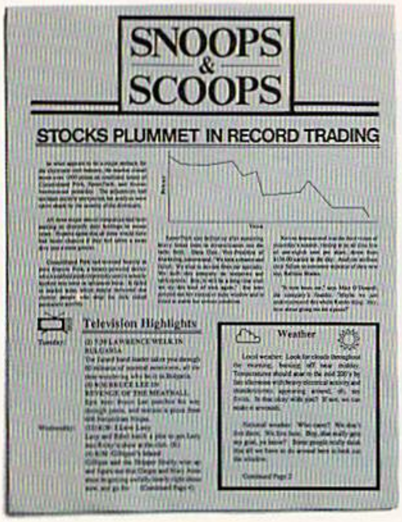
WE JUS
FRONT PA



SNOOPS & SCOOPS

STOCKS PLUMMET IN RECORD TRADING

Television Highlights

Tuesday:

Wednesday:

Weather

ED'S WEEKLY

The views and news of Ed.

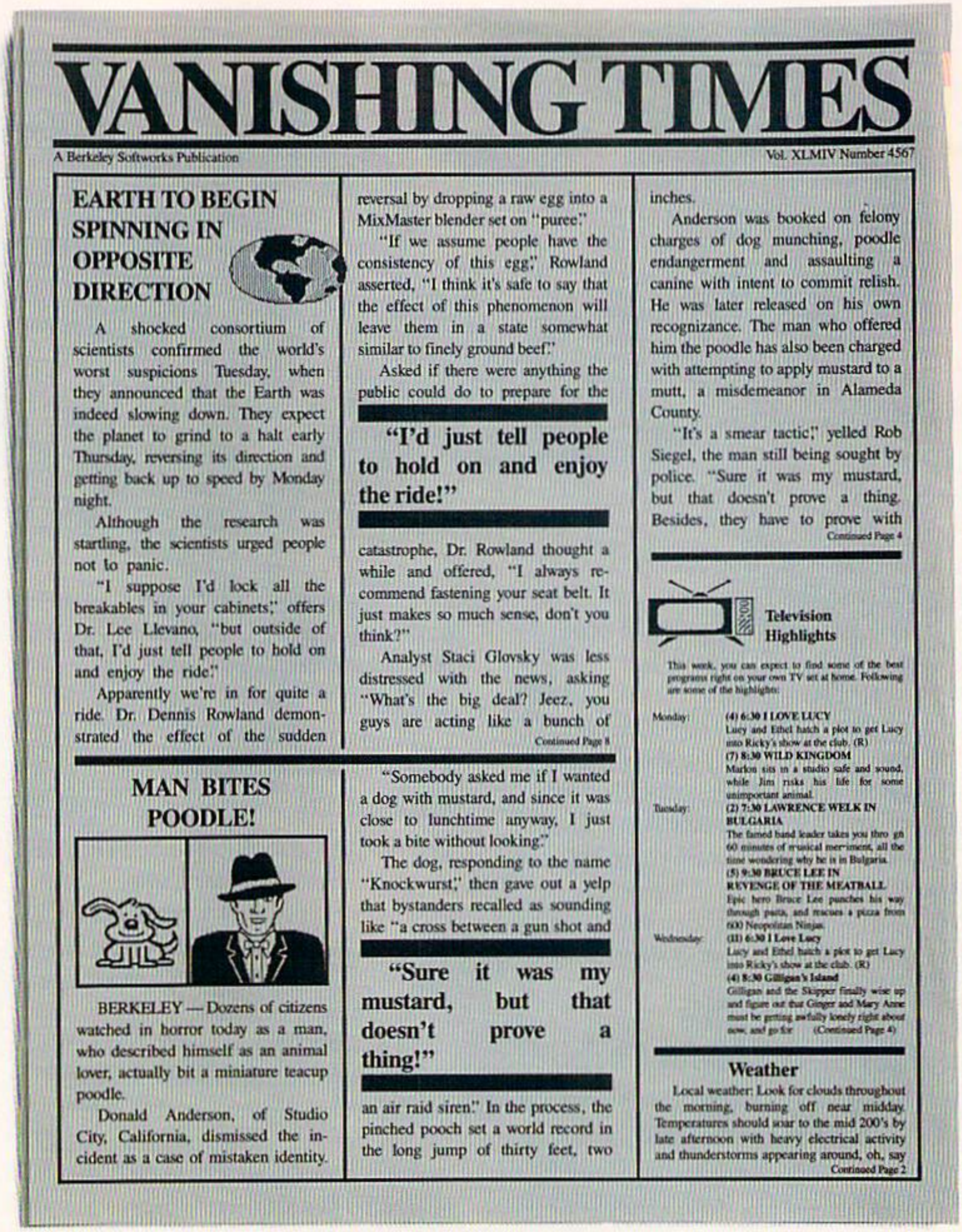
December 3

Basquing In The Beauty of Andorra

Weather

More people reading stuff like this!

Text can be printed in every font available through GEOS. These documents were printed on an Apple Laser Writer



VANISHING TIMES

A Berkeley Softworks Publication

Vol. XLMIV Number 4567

EARTH TO BEGIN SPINNING IN OPPOSITE DIRECTION

A shocked consortium of scientists confirmed the world's worst suspicions Tuesday, when they announced that the Earth was indeed slowing down. They expect the planet to grind to a halt early Thursday, reversing its direction and getting back up to speed by Monday night.

Although the research was startling, the scientists urged people not to panic.

"I suppose I'd lock all the breakables in your cabinets," offers Dr. Lee Llevano, "but outside of that, I'd just tell people to hold on and enjoy the ride."

Apparently we're in for quite a ride. Dr. Dennis Rowland demonstrated the effect of the sudden reversal by dropping a raw egg into a MixMaster blender set on "puree."

"If we assume people have the consistency of this egg," Rowland asserted, "I think it's safe to say that the effect of this phenomenon will leave them in a state somewhat similar to finely ground beef."

Asked if there were anything the public could do to prepare for the catastrophe, Dr. Rowland thought a while and offered, "I always recommend fastening your seat belt. It just makes so much sense, don't you think?"

"I'd just tell people to hold on and enjoy the ride!"

Analyst Staci Glovsky was less distressed with the news, asking "What's the big deal? Jeez, you guys are acting like a bunch of

Continued Page 8

MAN BITES POODLE!

BERKELEY — Dozens of citizens watched in horror today as a man, who described himself as an animal lover, actually bit a miniature teacup poodle.

Donald Anderson, of Studio City, California, dismissed the incident as a case of mistaken identity.

"Somebody asked me if I wanted a dog with mustard, and since it was close to lunchtime anyway, I just took a bite without looking."

The dog, responding to the name "Knockwurst," then gave out a yelp that bystanders recalled as sounding like "a cross between a gun shot and an air raid siren." In the process, the pinched pooch set a world record in the long jump of thirty feet, two inches.

"Sure it was my mustard, but that doesn't prove a thing!"

Anderson was booked on felony charges of dog munching, poodle endangerment and assaulting a canine with intent to commit relish. He was later released on his own recognizance. The man who offered him the poodle has also been charged with attempting to apply mustard to a mutt, a misdemeanor in Alameda County.

"It's a smear tactic," yelled Rob Siegel, the man still being sought by police. "Sure it was my mustard, but that doesn't prove a thing. Besides, they have to prove with

Continued Page 4

Television Highlights

This week, you can expect to find some of the best programs right on your own TV set at home. Following are some of the highlights:

Monday:
(4) 6:30 I LOVE LUCY
Lucy and Ethel hatch a plot to get Lucy into Ricky's show at the club. (R)
(7) 8:30 WILD KINGDOM
Marlon sits in a studio safe and sound, while Jim risks his life for some unimportant animal.

Tuesday:
(2) 7:30 LAWRENCE WELK IN BULGARIA
The famed band leader takes you thro gh 60 minutes of musical merriment, all the time wondering why he is in Bulgaria.
(5) 9:30 BRUCE LEE IN REVENGE OF THE MEATBALL
Epic hero Bruce Lee punches his way through pasta, and rescues a pizza from 600 Neopolitan Ninjas.

Wednesday:
(11) 6:30 I Love Lucy
Lucy and Ethel hatch a plot to get Lucy into Ricky's show at the club. (R)
(4) 8:30 Gilligan's Island
Gilligan and the Skipper finally wise up and figure out that Ginger and Mary Anne must be getting awfully lonely right about now, and go for (Continued Page 4)

Weather

Local weather: Look for clouds throughout the morning, burning off near midday. Temperatures should soar to the mid 200's by late afternoon with heavy electrical activity and thunderstorms appearing around, oh, say

Continued Page 2

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Circle 138 on Reader Service card.

T MADE
GE NEWS.

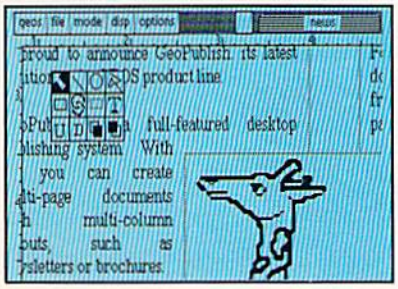
These days, the biggest story in the news is geoPublish. The page-making program for GEOS-equipped 64's and 128's that replaces lifeless layouts with page after page of powerful, punchy professionalism.

Freedom of the press.

Actually, geoPublish is very patriotic software. After all, what other application guarantees your freedom of self-expression? Well, geoPublish sure does. In fact, every piece it prints is dedicated to the preservation of your personality on paper.

Which means that finally, your newsletters never need to look like anyone else's, ever again.

All you do is draw a bunch of columns for your master layout. They could be two, four or sixteen across the page. They could be short and squat, or long and skinny. It's your call. After that, you just "pour" your geoWrite document, text, graphics and all—into column after column. Page after page.



proud to announce GeoPublish its latest
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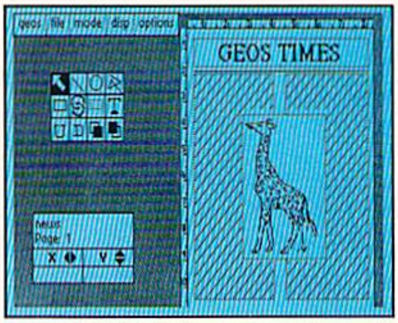
Everything fills up automatically until it fits firmly into your finely fashioned format.



Extras! Extras! Read all about 'em!

As every editor knows, even the best stories need punching up before they go to press. Which is why geoPublish features an array of artistic appliances designed to earn your pages a place in the history books.

You can resize text. Change fonts. Even insert or delete graphics anywhere on the page. You can lay text over graphics. Graphics over text. Or even wrap text *around* graphics.

And if your image doesn't fit, no problem. The proportional scaling tool can shrink or enlarge any art, be it your original or the stuff you find in Print Shop.™

Finally, those of you intent on making banner headlines should know that geoPublish doesn't wimp out when it comes to headlines. It screams them out, with genuine, newspaper-sized, 96 point megafonts.

Now, if you think that sounds terrific on paper, just wait until you see it printed out on a Laser-Writer.™

We've saved the best news for last.

And now, for the best part: you can create and save not one, but hundreds of layouts for later use.

And because it's part of the GEOS family, you can fully integrate text and graphics from all your other programs into every geoPublish piece you print.

So now that you know the latest scoop in software, why not subscribe to geoPublish yourself? Who knows? With stuff like this, you could be making front page news in no time.

To order call 1-800-443-0100 ext. 234

geoPublish $69.95

(California residents add 7% sales tax.)

$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

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GEOPUBLISH

GEOPUBLISH

GEOS COMPATIBLE

Berkeley Softworks

The brightest minds are working at Berkeley.

Circle 138 on Reader Service card.

SCIENTISTS
STOP THE AG

Time passes. Things get old. Let's face it, even Willie Mays retired. So there's no way your Commodore can compete with a newer machine, right?

Wrong.

The fact is that there's actually more power in your Commodore 64 or 128 than when you bought it. All you need is GEOS or GEOS 128 to find it.

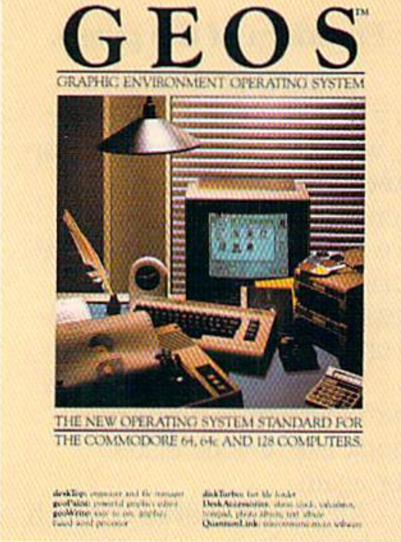
GEOS is the revolutionary operating system that works your hardware up to seven times harder than it's ever worked before. Loading. Processing. Accessing information. All at the mere touch of a mouse or joystick.

Time Warps Discovered

With GEOS, everything speeds up. Including you. Because the system is incredibly fast and ridiculously easy to learn: GEOS shows you options, you point at what you want and click your mouse.

End of lesson.

Now, once you know that, you know how every other GEOS application works, too. Like geoWrite, which lets you punch up paragraphs with five different fonts. Or geoPaint, which dresses up diagrams with an arsenal of artistic appliances. Both are built right into the GEOS disk. And when you put them together with geoWrite Workshop's LaserWriter compatibility, every new GEOS document comes out looking like an old master.


GEOS™
GRAPHIC ENVIRONMENT OPERATING SYSTEM
THE NEW OPERATING SYSTEM STANDARD FOR
THE COMMODORE 64, 64c AND 128 COMPUTERS
deskTop
geoPaint
geoWrite
diskTurbo
Desk Accessories
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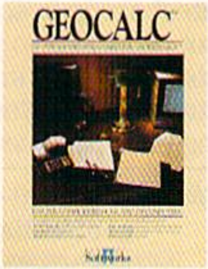
GEOPUBLISH™

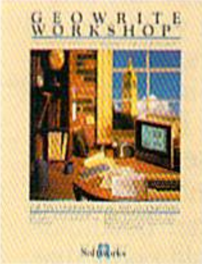
GEOPUBLISH

NEW The desktop publishing program that lets you design formats, column widths and page layouts. Accepts any geoWrite text and converts non-GEOS text. Wraps text around graphics automatically. Headline fonts up to 192 pt. Complete graphics toolbox.



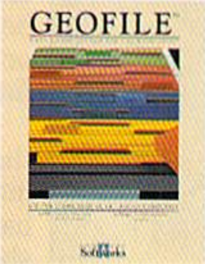
GEOCALC

The GEOS-compatible, number-crunching spreadsheet for tracking and analyzing numerical data. Create your own formulas, perform calculations for anything from simple geometry to "what if" cost projections.



GEOWRITE WORKSHOP

NEW All the GEOS-compatible tools a writer needs, including new geoWrite 2.1 with headers, footers, margins to 8" and features to justify, center, search and replace text. Includes a Text Grabber (for converting text from programs like Paper Clip), geoMerge and LaserWriter printing capability.



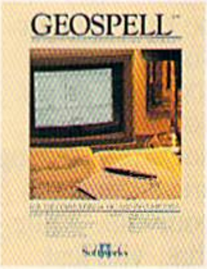
GEOFILE

The GEOS-compatible database manager that sorts, edits and prioritizes whatever data you feed it. You fill out the "input form," specify your command, and geoFile takes it from there.

GEOPROGRAMMER™

GEOPROGRAMMER

NEW A programmer's dream for writing your own programs or supercharging someone else's. With easy yet mind-boggling features like graphics that insert by simply cutting and pasting directly from geoPaint. Comes with geoAssembler, geoLink and geoDebugger for modular assembly and testing.



GEOSPELL

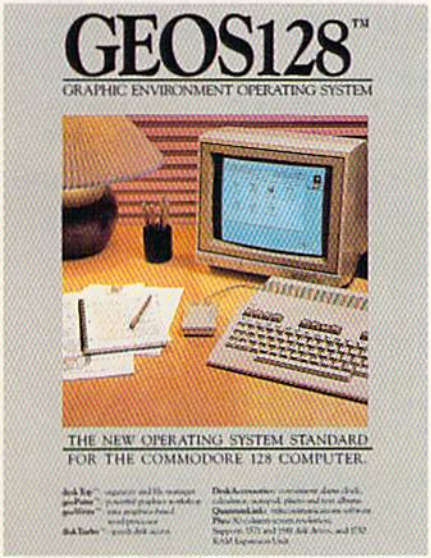
NEW Over 28,000 word geoDictionary for checking spelling. Lets you add words, switch dictionaries, edit, and automatically search and replace. Customize and create fonts up to 48 pt. with geoFont.

Circle 140 on Reader Service card.

AT BERKELEY
NG PROCESS!

Avoid Old Age Forever!

But how does all this affect your Commodore's future? Well, it means you don't ever have to worry about it becoming obsolete, because there are all kinds of GEOS applications for almost every purpose.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GRAPHIC ENVIRONMENT OPERATING SYSTEM
THE NEW OPERATING SYSTEM STANDARD
FOR THE COMMODORE 128 COMPUTER.

128 version features 128K memory, full 80 column screen, supports 1571/1581 disk drives. 1750 RAM expansion and runs at a full 2 MHz for lightning speed.

You can finally get organized with geoFile, the database that searches, finds and lists almost anything that you want to search, find and list. You can manipulate mathematics or figure out financial formulas with geoCalc. If writing's your style, geoWrite Workshop can help you hammer out any kind of report. And geoPublish is the desktop publishing program that is still making headlines throughout the entire industry.

Of course, that's merely a sampling of what the GEOS environment has to offer. Because even as you read this, legions of our engineers are hard at work, developing even more GEOS applications for even more uses.

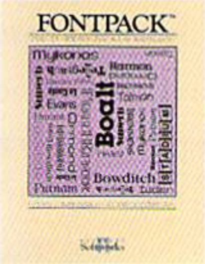
All of which means you get a whole lot more out of your Commodore than you ever bargained for. And while that may not actually keep your Commodore from getting older, that's certainly something it could live with for a long, long time.

Berkeley Softworks

The brightest minds are working at Berkeley.

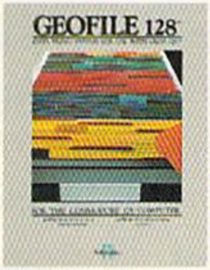
DESKPACK

NEW Six GEOS-compatible applications: Graphics Grabber for importing art from Print Shop,™ Newsroom™ and Print Master™ graphics; Calendar; Icon Editor and Black Jack Dealer. Now includes geoDex, the GEOS-compatible directory that allows you to create lists by name, address, phone number, and geoMerge to customize form letters and invitations. In either 40 or 80 col. mode.



FONTPACK

A collection of even more fonts for use with GEOS applications, in various shapes and sizes for more expressive and creative documents. Includes font editor. In either 40 or 80 column mode.



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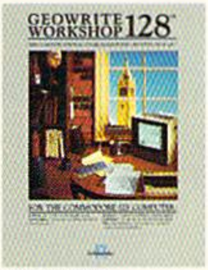

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GEOCALC 128

GEOCALC 128

NEW The GEOS-compatible, number-crunching spreadsheet for tracking and analyzing numerical data. Create your own formulas, perform calculations for anything from simple geometry to "what if" cost projections. 128 version features full 80 column screen. Due soon!

To order call
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Circle 140 on Reader Service card.

MAGIC

Drive a hot race car down a zig-zag track; rename disks to clear the screen when the directory is listed; add over 2K of additional RAM to Basic 7.0.

Compiled by TIM WALSH

$45A *FRERE JACQUES*

Wouldn't you love to attend an evening *soiree* in Paris? Or maybe catch a *bain de soleil* on the French Riviera? Close your eyes and play my program a few times on your C-128 for an uplifting French experience. *Merci!*

```
0 REM FRERE JACQUES - JIM WALLACE :REM*231
10 TEMPO 11                       :REM*107
20 PLAY"V105T5"                    :REM*61
30 A$="QCDECCDECEFHGQEFHG          :REM*28
40 B$="IGAGFQECIGAGFQEC"           :REM*73
50 C$="QC04G05HCQC04G05HC"         :REM*89
60 PLAY A$+B$+C$                  :REM*147
```

—JIM WALLACE, TOMS RIVER, NJ

$45C C-64 SLIDING MESSAGE

If you'd like to jazz up your programs a little, use my short routine, called Sliding Message. It will spice up any program introduction, error message or other display.

Place your message in line 10 of the program, and use line 30 to change the filler character. Adjust the delay (default = 50) and see what happens. To slide the message once, delete line 70.

```
0 REM SLIDING MESSGE - JOHN GOTTS :REM*149
10 A$="ANY MESSAGE UP TO 39 CHARACTERS!"
                                  :REM*179
20 A=LEN(A$):DIMB$(39):PRINT"{SHFT CLR}"
                                    :REM*4
30 FORT=1TO39-A:A$=" "+A$:NEXT:A=39:REM*49
40 FORT=1TOA:B$(T)=MID$(A$,T,1):NEXT
                                   :REM*41
50 FORT=ATO1STEP-1:PRINT"{HOME}{5 CRSR DNs
   }{SHFT INST}"B$(T):FORX=1TO50:NEXT:NEXT
                                   :REM*37
60 FORT=1TOA:PRINT"{HOME}{5 CRSR DNs} ";CH
   R$(20):FORX=1TO50:NEXT:NEXT     :REM*65
70 GOTO50                         :REM*200
```

—JOHN E. GOTTS, STERLING HEIGHTS, MI►

TRICK OF THE MONTH

$45B C-64 ROAD RACER

If you liked River Run (September 1987), then you'll love C-64 Road Racer. Your car is a sprite (could it be an Austin Healy sprite?) that you pilot down a winding race course, using the H (to turn left) and J (to turn right) keys. Every marker you pass adds one point to your score.

So challenge your reflexes with some intense driving. If your racing skills already approach those of Formula-One caliber, decrease the course width (variable W).

```
0 REM C-64 ROAD RACER - J. R. CHARNETSKI
                                   :REM*7
10 DATA 240,0,15,243,255,207,243,255,207,2
   55,60,255,243,90,207,243,102,207,243
                                  :REM*65
20 DATA 126,207,3,126,192,3,60,192,3,255,1
   92,3,255,192,3,0,192,3,0,192,3,0,192
                                 :REM*192
30 DATA243,0,207,243,129,207,243,195,207,2
   55,231,255,241,255,143,240,255,15,240
                                 :REM*250
40 V=53248:FORU=832TO894:READN:POKEU,N:NEX
   T                             :REM*174
50 POKEV+32,0:POKEV+33,0:DATA 126,15,0
                                 :REM*245
60 W=10:R=54296:I=7:J=12:L=1986:M=8:MK=81:
   B=198:S=1-J:X=140:POKE2040,13:POKEV,X
                                 :REM*117
70 POKE646,INT(RND(1)*J+2):PRINT"{SHFT CLR
   }ROAD RACER (-H J-) PRESS ANY KEY":POKE
   B,0                           :REM*135
80 WAITB,1:POKEV+1,139:POKEV+39,1:POKEV+21
   ,1:P=PEEK(V+31):FORD=1TO23:PRINT:NEXT
                                 :REM*207
90 POKER,J:S=S+1:IFZ=0THENI=I+1   :REM*54
100 N=PEEK(197):IFN=29 THEN IFX>60 THEN X=
    X-M                          :REM*248
110 IF N=34 THEN IFX+M<256 THENX=X+M
                                 :REM*213
120 IFI=INT(RND(.)*J+M)ORI>20THEN Z=1-Z
                                 :REM*197
130 POKEV,X:IFZTHENI=I-1:IF I<3THENZ=.
                                  :REM*85
140 POKER,0:POKEL+I,MK:POKEL+I+W+1,MK:PRIN
    T                            :REM*126
150 ON-(PEEK(V+31)=.)GOTO90:POKEV+21,0
                                 :REM*166
160 PRINT"{SHFT CLR}SCORE="S:PRINT"{CRSR D
    N}TRY AGAIN Y/N?":POKEB,0:WAITB,1:GETA
    $:IFA$="Y"THEN60             :REM*210
```

—JOSEPH CHARNETSKI, DALLAS, PA

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Wizardry
PROVING GROUNDS OF THE MAD OVERLORD
SIR-TECH

Wizardry®

Now the world of Wizardry comes to Commodore 64/128

PROVING GROUNDS of the MAD OVERLORD

Also available for:
Apple II Series,
IBM PC & compatibles,
Tandy 1000 SX & EX,
Macintosh

With your Commodore 64 or 128 you can now experience an exciting initiation into the internationally-acclaimed world of the Wizardry Gaming System.

Begin with the first scenario*: Proving Grounds of the Mad Overlord. It challenges you to overcome devious tricks and sudden traps, strange and mysterious encounters, maze upon maze of puzzles, stimulating and intricate subplots and sophisticated themes. Ingenious multi-level, mind-bending tests abound with vile creatures, unspeakable villains, courageous adventurers and strong allies to hinder and help you achieve ultimate victory.

SIR-TECH

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PLAY IT TO THE HILT!

* Many other Wizardry scenarios coming for Commodore players.

$45D Keypress Detector

Mention the number 653 to most C-64 programmers, and they immediately think, "wait," because a program's execution can be stopped by entering the WAIT 653,1 command.

I wrote a short program that reacts to the control, Commodore and shift keys—the keys that affect location 653. By using the logic in my Magic program, you can write routines that halt program execution until two or more keys are pressed simultaneously.

```
0 REM KEYPRESS DETECTOR - T. WALSH:REM*192
10 PRINT"{SHFT CLR}":R=PEEK(653)  :REM*115
20 A$="{CTRL 2}SHIFT":B$="{CTRL 8}COMMODOR
   E":C$="{CTRL 1}CONTROL":D$="{CTRL 4}/":
   E$="."                          :REM*244
30 F$="{HOME}{COMD 7}YOU'RE PRESSING "
                                    :REM*69
40 IF R=0 THEN 130                 :REM*112
50 IF R=1 THEN 120                 :REM*137
60 IF R=2 THEN A$=B$                :REM*75
70 IF R=3 THEN A$=A$+D$+B$          :REM*54
80 IF R=4 THEN A$=C$               :REM*110
90 IF R=5 THEN A$=A$+D$+C$         :REM*107
100 IF R=6 THEN A$=B$+D$+C$        :REM*116
110 IF R=7 THEN A$=A$+D$+B$+D$+C$  :REM*185
120 PRINT F$+A$+E$:GOTO 10         :REM*216
130 RUN                             :REM*13
```

—Tim Walsh, *RUN* Staff

$45E Clear Screen Directory

After renaming a disk using the trick below, the screen automatically clears whenever you list the disk directory to the screen. In its present form, the program requires that the disk be formatted beforehand, but the technique I use is outlined in line 50, and it can be applied to format a disk, as well.

```
0 REM CLEAR SCREEN DIRECTORY - CHARLES JON
  ES                                :REM*215
10 INPUT"{SHFT CLR}NAME OF DISK:";DN$
                                    :REM*169
20 PRINT"PLACE A FORMATTED WORK DISK IN DR
   IVE"                              :REM*45
30 PRINT"AND PRESS RETURN..."       :REM*107
40 GET A$:IF A$="" THEN 40          :REM*224
50 OPEN15,8,15,"N:"+CHR$(13)+"{SHFT CLR}"+
   DN$                              :REM*199
60 CLOSE15                          :REM*220
70 PRINT"{SHFT CLR} CLEAR SCREEN DIRECTORY
    INSTALLED!"                     :REM*231
```

—Charles Jones, Carriere, MS

$45F LaBar's Lament

Commodore 128 users still comtemplating Thomas Smith's C-128 Engineering Disaster (trick $404, August 1987) might lapse into an altered state of consciousness over my elementary engineering enigma. So, why while winter away waiting? Don't linger any longer—lapse into LaBar's Latest Lament.

```
0 REM LABAR'S LAMENT - SI LABAR     :REM*61
10 GRAPHIC1,1:DRAW 1,240, 75 TO 240, 150 T
   O 80, 150 TO 80, 75 TO 275, 75 TO 275,
   170 TO 15, 170 TO 15, 20 TO 280, 20 TO
   310,45 TO 310, 190 TO 40, 190 TO 15,170
                                    :REM*251
20 DRAW 1, 310, 45 TO 50, 45 TO 50, 150 TO
    80, 150:DRAW 1, 275, 170 TO 245,150:DR
   AW 1, 80, 75 TO 50,45:COLOR1,16:PAINT 1
   , 160,100:PAINT 1,10,10:SLEEP5 :REM*187
30 GRAPHIC0:PRINT"{SHFT CLR}PRESS A KEY TO
    TOGGLE BETWEEN SCREENS"           :REM*4
40 GETKEYA$:GRAPHIC1                :REM*176
50 GETKEYA$: GOTO 30                 :REM*94
```

—Si LaBar, Bethlehem, PA

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Attention C-128 programmers! When you're writing Basic programs and don't need the 40-column graphics of your C-128, type in this line to get an extra 2300 bytes of Basic RAM:

```
POKE 45,1:POKE 46,19:POKE 4864,0:NEW
```

—Howard Lew, San Francisco, CA

$461 DOS 5.1 Wedge Quicksave

Nearly all C-64 users like to keep a copy of Commodore's DOS wedge on their work disks. After all, it simplifies long, complicated disk commands into one- or two-character commands. Unfortunately, since the DOS wedge is pure machine language, it isn't easily copied to disk without special techniques. Until now.

My utility, called DOS 5.1 Quicksave, quickly copies the wedge to any disk. First, load the wedge as usual, then type in DOS 5.1 Quicksave. Now insert the formatted disk you want to place the wedge on into your drive and run the program. Presto! DOS 5.1 is on the disk!

```
0 REM COPY DOS WEDGE - THOMAS B. SMITH
                                    :REM*108
10 OPEN8,8,8,"DOS 5.1":POKE251,0:POKE252,2
   04:POKE780,251:POKE781,90:POKE782,207
                                    :REM*113
20 SYS 65496                        :REM*234
```

—Thomas B. Smith, Gallipolis, OH

$462 C-128 Explosive Ending

Dramatic sound effects can enhance almost any game. My routine makes all three voices on the C-128 rise in pitch until only one is left, followed by a powerful explosion that rocks the 40-column screen. Don't fret—everything returns to normal after the explosion.

```
0 REM C-128 EXPLOSIVE END - JOHN KUHNE
                                     :REM*59
10 SOUND 1,45000,2000,0,1,3,0       :REM*102
20 SOUND 2,45000,1500,0,1,10,0       :REM*83
30 SOUND 3,45000,1000,0,1,15,0      :REM*154
40 SOUND 1,1950,100,1,1,25,3        :REM*104
50 SOUND 2,2950,100,1,1,15,3         :REM*23
60 SOUND 3,950,100,1,1,10,3          :REM*12
70 FORK=1 TO 4:FORJ=1TO42:POKE53270,J:NEXT
   J:NEXTK                           :REM*65
```

—John Kuhne, Newmarket, Ontario, Canada

Continued on p. 113.

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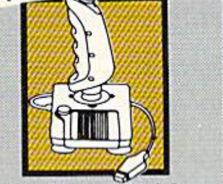

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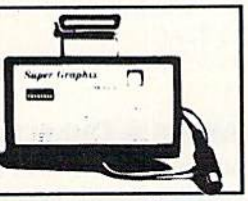

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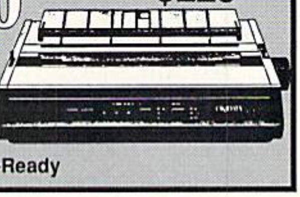

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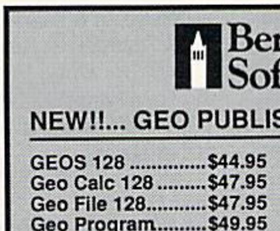

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Compiled by HAROLD R. BJORNSEN

GUNSHIP MEDAL OF HONOR

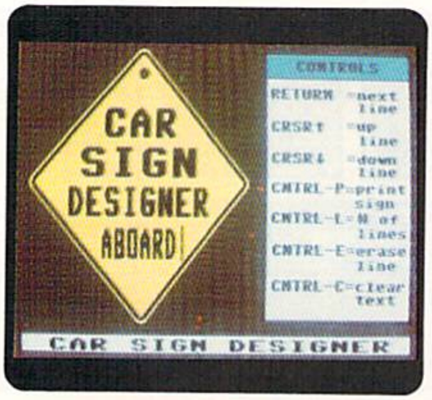
HUNT VALLEY, MD—Larry Woodworth, a 27-year-old electronics technician from Syracuse, New York, is the first winner of the Congressional Medal of Honor in MicroProse Software's Gunship helicopter simulation and an honorary member of the Gunship Design Team.

"I feel like a little kid at Christmas," he said. "I didn't expect this kind of recognition when I won the medal. In fact, I didn't realize until recently that I was the first to do it." Woodworth works on military fire-control computers for General Electric Corp.

The Congressional Medal of Honor is the highest achievement in the Gunship simulation of an Apache AH-64A attack helicopter. Players are awarded military decorations and receive promotions in rank based on their performance on missions in South Vietnam, Central America and Western Europe.

RUN READER ON BOARD

WOODHAVEN, NY—Zebra Systems (78-06 Jamaica Ave., Woodhaven, NY 11421) has released its Car Sign Designer for the C-64. The program lets you create diamond-shaped car signs on your computer screen before printing out the result on bright-yellow paper, which you then insert into one of two reusable clear plastic sign holders with suction cups included in the package. Available for $29.95.



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PROGRAMMER'S CHALLENGE

BLUE RIDGE SUMMIT, PA—Tab Books (PO Box 40, Blue Ridge Summit, PA 17214) has released *The Commodore Programmer's Challenge: 50 Challenging Problems to Test Your Programming Skills—with Solutions in Basic, Pascal and C.* Fun is the main objective of the book, but the problems also help computerists polish their programming skills or learn to program in a new language.

The 50 problems are divided equally into ten sets of five problems each. The sets represent different tests, and the five problems in each test are graded according to level of difficulty: the first two are for beginners, the next two for more experienced programmers and the last is very difficult. The 240-page book has 163 illustrations and is available in paperback for the C-64 for $14.60.

Check Reader Service number 401.

LESS TAXING

RANDALLSTOWN, MD—Master Software (6 Hillery Court, Randallstown, MD 21133) has released the 1987 version of its Tax Master, an aid in the preparation of U.S. Federal Income Taxes. The C-64 program covers all the new tax laws and guides you through the preparation of Forms 1040 and 4562 and Schedules A–F. It performs all calculations, figures your tax automatically, and even transfers results from one form to another. The tax tables are included. Available for $30.

Check Reader Service number 403.

THE GAME IN SPAIN

CAMBRIDGE—Ticket to Spain, the new title in the software travelogue series from Blue Lion Software (90 Sherman St., Cambridge, MA 02140), is available for the C-64. In this program, you travel through Spain in search of a family heirloom. With a limited budget and a series of tasks to fulfill, you set out on a quest that takes you to various cities and towns, such as Seville, Madrid, Toledo, Granada and Barcelona. You'll explore historical landmarks, converse with the locals, attend a bullfight, shop or dine in authentic locales. All the while, you'll learn about Spanish culture and language, history, geography and contemporary life. A phrasebook is included in the package to help you with the most difficult situations. $29.95.

Check Reader Service number 404.

OUTSTANDING SALES

WASHINGTON, DC—The Software Publishers Association has given awards for outstanding sales in 1987 to the following software packages available for the C-64 and/or C-128 . To qualify, a software package must have sold more than 250,000 copies for a platinum label, more than 100,000 copies for a gold label and more than 50,000 copies for a silver label.

PLATINUM—

Broderbund's The Print Shop Graphics Library: Disk 1 and Bank Street Writer.

Davidson & Associates' Math Blaster!.

Hi-Tech Expressions' Jingle Disk.

Infocom's The Hitchhiker's Guide to the Galaxy and Zork I.

MicroProse's Silent Service and F-15 Strike Eagle.

GOLD—

Accolade's HardBall!

Activision's Hacker.

Broderbund's Where in the World Is Carmen Sandiego? and The Print Shop Graphics Library: Disk 3.

Cosmi's Super Huey.

Data East USA's Karate Champ, Commando and Tag Team Wrestling.

Electronic Arts' The Bard's Tale and Racing Destruction Set.

Hi-Tech Expressions' CardWare and HeartWare.

Infocom's Leather Goddesses of Phobos.

Micro League Sports Association's Micro League Baseball.

MicroProse's Gunship.

Software Toolworks' Chessmaster 2000.

SILVER—

Accolade's Ace of Aces, Fight Night, Mean 18 and Dam Busters.

Activision's Hacker II: The Doomsday Papers, Championship Baseball, GFL Championship Football, and GBA Championship Basketball: Two-On-Two.

Cosmi's Super Huey II.

Data East USA's Kung Fu Master and Commando.

Davidson & Associates' Spell It!.

Firebird's Elite.

Hi-Tech Expressions' PartyWare.

Infocom's Wishbringer.

WHISTLE MUSIC

EUGENE, OR—Voice Master Jr., a micro-size speech digitizer and voice-recognition system for the C-64, lets you record and play back up to 64 words or phrases, in any accent and any language. With the system, your computer can understand up to 32 voice commands, and additional voice commands can be loaded from disk. Another feature, the Voice Harp, lets you create and compose music by whistling into the microphone. Notes corresponding to your whistle-pitch scroll across the screen as you whistle. Available for $39.95 from Covox, 675-D Conger St., Eugene, OR 97402.

Check Reader Service number 402.

TOY TAKES THE HELM

WEST CHESTER, PA—Irving Gould, chairman and CEO of Commodore International Limited, has announced that Max Toy will join the company as president and chief operating officer of Commodore Business Machines, the company's U.S. subsidiary.

A computer-industry veteran, Mr. Toy has held management positions at ITT, Compaq and IBM. Says Gould, "Max has over 12 years of personal computer industry experience and has established solid distribution networks and VAR programs. This expertise will complement the progress already made in U.S. operations. . .and in sales and marketing."

DON'T GET TOO CLOSE

CHAMPAIGN, IL—Scenery Disk 11, a C-64 program for the Flight Simulator II and Jet programs from SubLogic (713 Edgebrook Drive, Champaign, IL 61820), covers the central Great Lakes area of the United States. The disk features detailed views of Detroit, with features such as the Ambassador Bridge, Renaissance Center and Tiger Stadium; Pittsburgh, showing skyscrapers and bridges spanning three rivers; and Niagara Falls, where you can actually fly below the rim of the Niagara River canyon right up to the falls. To eliminate the monotony of flying between cities, a new default ground pattern simulating fields and other areas of varying color has been added. It's available for $24.95.

Check Reader Service number 406.

JIMBO BABY IS BACK

NORTHBROOK, IL—And so is the Mad Leader, in Infiltrator II, the helicopter simulator/graphics adventure sequel from Mindscape (3444 Dundee Rd., Northbrook, IL 60062). As Captain Johnny "Jimbo Baby" McGibbits, you must sharpen your flying skills and file your flight plan, for headquarters has assigned you to *the* mission—to stop the evil Mad Leader from dominating the world. It's available for the C-64 for $34.95.

Check Reader Service number 400.

HANG 'EM HIGH

Feed-A-Form stands ready to feed up to four forms to your form-feeder.

WESTWOOD, MA—Feed-A-Form holds up to four continuous-feed forms simultaneously for convenient feeding to your printer. The forms feed right from their cartons stored under the printer table. The end of each stock of forms is held in place between two acrylic bars until you feed the desired form into the printer. The aluminum, steel and acrylic feeder measures 18 by 18 by 21 inches and weighs eight pounds. It's available for $89.95 from Feed-A-Form, 29 Dover Terrace, Westwood, MA 02090.

Check Reader Service number 408.

HO, HO, HO!

NEW YORK, NY—'Twas the Night Before Christmas, an animated musical holiday disk for the C-64, has been released by Simon and Schuster Software (One Gulf + Western Plaza, New York, NY 10023). The program narrates the classic poem with animation and musical accompaniment.

But Santa has also included other nifty features.

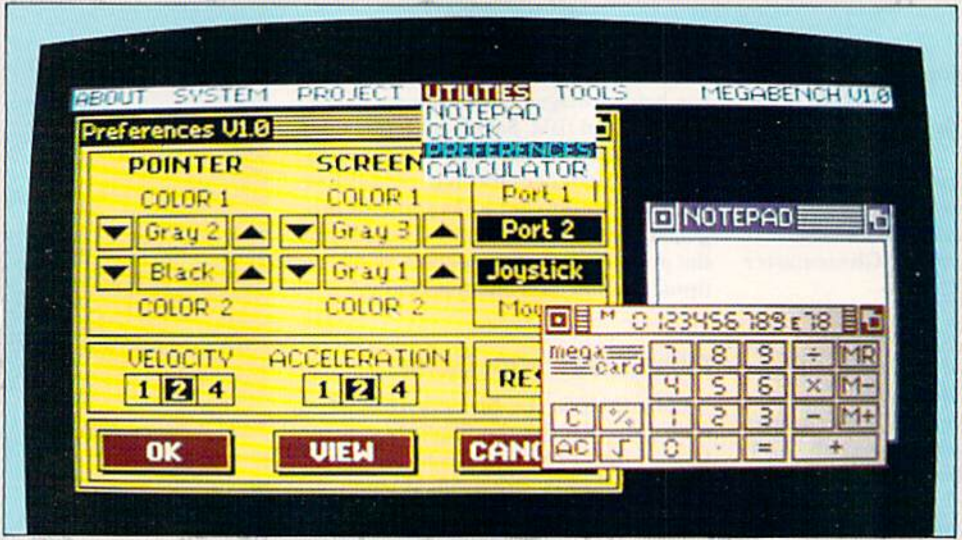
With it, you can send animated and personalized Christmas disks to friends and relatives, type and print letters to Santa (the letter is automatically addressed to the North Pole when printed out), print Christmas cards and play the Christmas game (a computerized jigsaw puzzle). It's available for $8.95 and requires an MPS-801 or -1000 printer or compatible.

Check Reader Service number 409.■

Circle 72 on Reader Service card.

KEEP IT SIMPLE!

NEW FROM HOLLAND

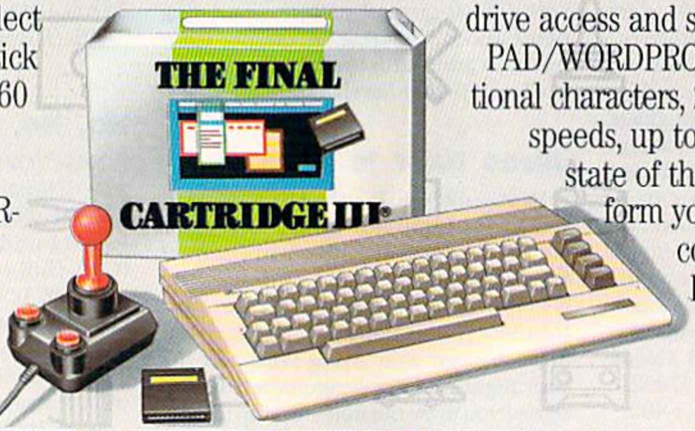

ABOUT
SYSTEM
PROJECT
UTILITIES
TOOLS
MEGABENCH V1.0
NOTEPAD
CLOCK
PREFERENCES
CALCULATOR
Preferences V1.0
POINTER
SCREEN
COLOR 1
COLOR 1
Gray 2
Gray 3
Black
Gray 1
COLOR 2
COLOR 2
Port 1
Port 2
Joystick
VELOCITY
ACCELERATION
1 2 4
1 2 4
RES
OK
VIEW
CANC
NOTEPAD
M 0.123456789E78
mega card
7 8 9 ÷ MR
4 5 6 × M-
C % 1 2 3 - M+
AC √ 0 . = +

NEW FROM HOLLAND

THE FINAL CARTRIDGE III®

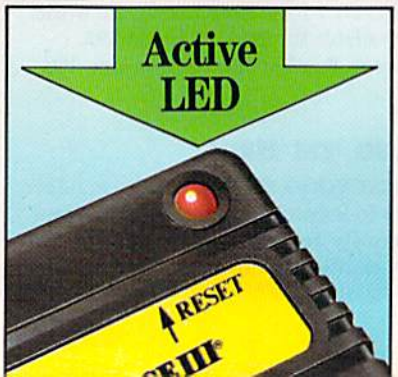
A POWERFUL 64K ROM BASED OPERATING SYSTEM FOR THE C64 AND C128[1]

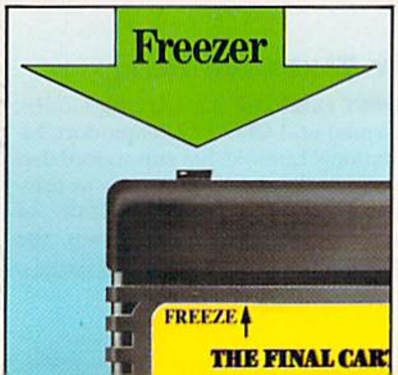
Easy to use WINDOWS and PULL DOWN MENUS allow you to select with either mouse, joystick or keyboard more than 60 new COMMANDS and FUNCTIONS.
Various PRINTER-INTERFACES, a BASIC TOOLKIT.


THE FINAL
CARTRIDGE III®

Comfortable ML MONITOR including 1541 drive access and sprite-editing, a NOTEPAD/WORDPROCESSOR with proportional characters, 2 DISKLOADERS with speeds, up to 15 times faster and a state of the art FREEZER. Transform your Commodore into a complete new - AMIGA LOOK ALIKE - system.

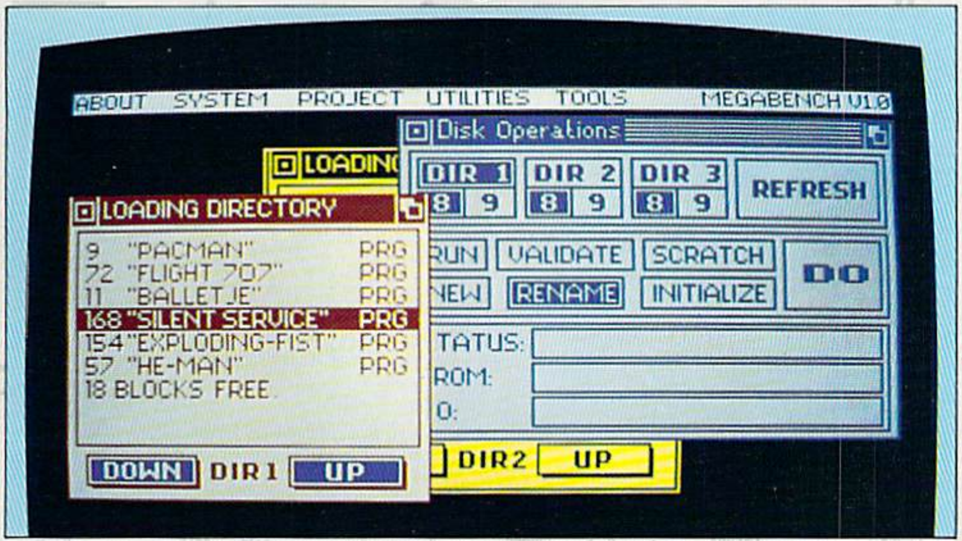
Reset
RESET
ARTRIDGE III


Active LED
RESET
GE III


Freezer
FREEZE
THE FINAL CAR

Circle 72 on Reader Service card.

WINDOWS


ABOUT SYSTEM PROJECT UTILITIES TOOLS MEGABENCH V1.0
Disk Operations
LOADING
DIR 1
DIR 2
DIR 3
8 9
REFRESH
RUN
VALIDATE
SCRATCH
DO
NEW
RENAME
INITIALIZE
TATUS:
ROM:
O:
DOWN
DIR 1
UP
DIR 2
UP

LOADING DIRECTORY

```
9   "PACMAN"         PRG
72  "FLIGHT 707"     PRG
11  "BALLETJE"       PRG
168 "SILENT SERVICE" PRG
154 "EXPLODING-FIST" PRG
57  "HE-MAN"         PRG
18 BLOCKS FREE.
```

THE FINAL CARTRIDGE III®

The high-resolution bit mapped windows are selected from a menu bar. An unlimited number of windows can be open on the screen at the same time. The windows can be freely moved on the screen. The following windows are already implemented in ROM:

PREFERENCE WINDOW
Selects: mouse port, joystick port, mouse speed, joystick speed, screen colors, pointer colors, keyboard click, keyboard repeat.

CALCULATOR
Complete simulation of a LCD-calculator. Input either with mouse, joystick or keyboard. The numeric key-pad of the C128 can be used in C64-mode.

NOTE PAD
Easy to use wordprocessor with proportional characters enables you to store and print small notes, letters, etc.

DIRECTORY WINDOWS
Enables you to open directories from different disks and drives, sort and print directories.

DISK WINDOWS
Load, Run, Rename, Validate, Scratch, Initialize, Fast format disks.

TAPE WINDOW
Activates fast and normal modes.

PRINTER WINDOWS
Select different printers, such as Commodore serial, Centronics, RS 232, Color printers.

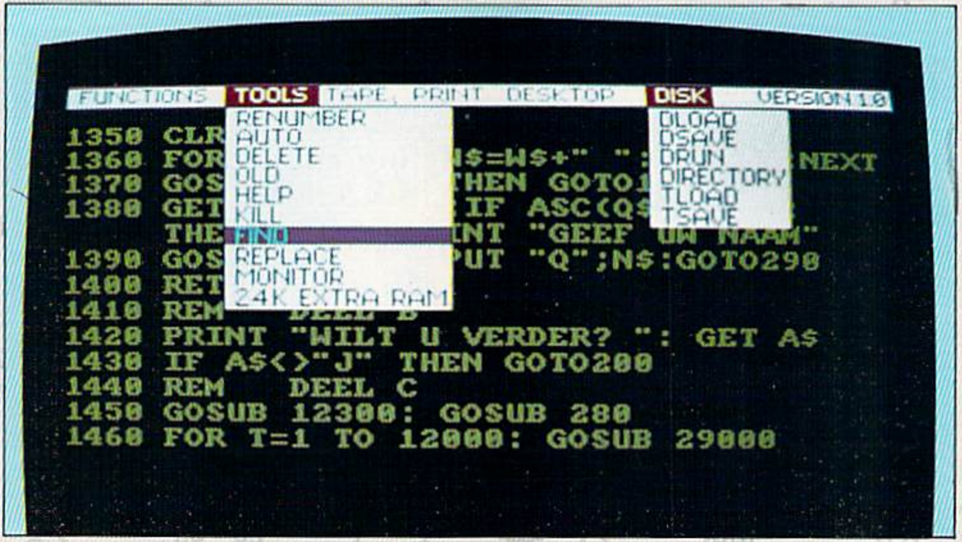
REQUESTER WINDOWS

DISK BASED USER WINDOWS
Design your own windows.

CLOCK
Real Time Clock, with Alarm.

Circle 150 on Reader Service card.

PULL DOWN MENU



```
1350 CLR
1360 FOR          N$=W$+"  ":          NEXT
1370 GOS          THEN GOTO1
1380 GET          IF ASC(Q$
     THE          INT "GEEF    UW NAAM"
1390 GOS          PUT "Q";N$:GOTO290
1400 RET
1410 REM     DEEL B
1420 PRINT "WILT U VERDER? ": GET A$
1430 IF A$<>"J" THEN GOTO200
1440 REM   DEEL C
1450 GOSUB 12300: GOSUB 280
1460 FOR T=1 TO 12000: GOSUB 29000
```

THE FINAL CARTRIDGE III®

Almost all commands and functions that are not activated by windows can be selected from a menu bar, which appears on top of the screen after pressing the fire button, either in Basic or from the freezer. The following Basic Toolkit and keyboard extra's are included:

• Renumber • Auto • Delete • Old • Help • Kill • Find • Replace • 24K extra Ram for Basic • Append • DAppend • DSave • DOS • Monitor • Drive monitor • Sprite editing • Centronics interface • Fast format • Low Res screendumps • Plist • Scrolling up and down • Stops and continues listings • Preprogrammed functionkeys • Packer/Cruncher • Hex to decimal conversion • Pokes, syscalls and variables may all have Hexadecimal values • Trace, Dump, Order, Mem.

1) In 64 mode only. Colors simulated, specifications may change without notice.

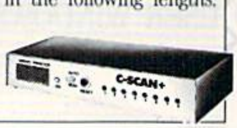
Attention Schools and Educators

C-SCAN + is the ultimate network for Commodore computers, eight computers share one or two disk drives, and only one printer and software program is needed. Simple installation, auto scanning and auto power on. Works with The Final Cartridge. 1 year warranty.

C-Scan +	$199.95

Cables available in the following lengths:

9 ft.	$13.95
12 ft.	$15.95
18 ft.	$17.95
36 ft.	$19.95



Final Cartridge III® Only...

$69.95

ORDERING INFORMATION

Final Cartridge III®	$ 69,95
Deluxe Joystick	$ 9.95
Deluxe Mouse	$ 34,95

Send your cheque- or moneyorder to:
H&P Computers, 154 Valley Street,
South Orange No. 07079 or call 201-763-3946
Dealer inquiries 201-763-1693
Certified user groups call for special pricing.
Visa/Mastercards accepted.
Add $ 3.00 for shipping & handling.
(Canadian orders add $ 8.00 for shipping & handling.)

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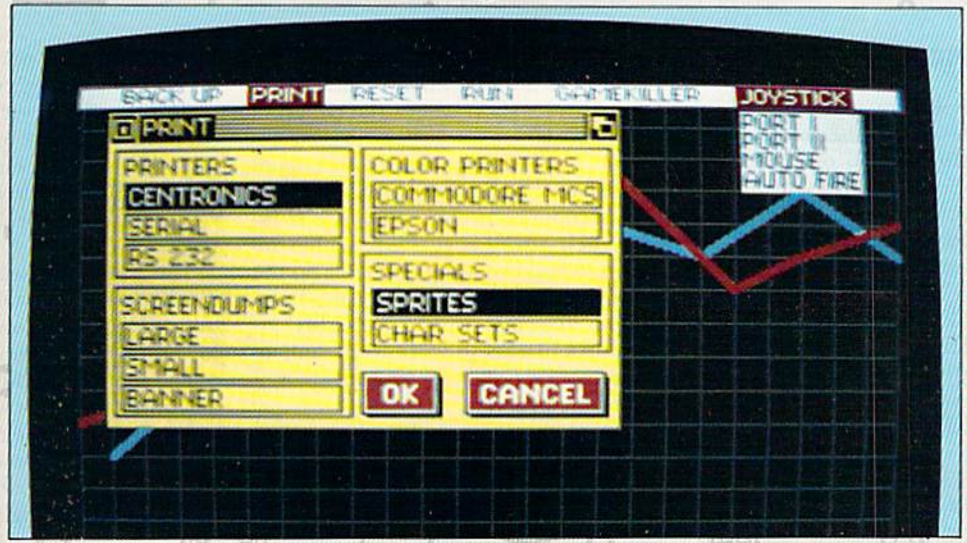
Riska b.v., Home & Personal Computers
Wolphaertsbocht 236, 3038 MV Rotterdam - The Netherlands. Tel. 010 - 423 19 82. Telex 26401 a intx nl.

Circle 150 on Reader Service card.

FREEZER MENU



BACK UP
PRINT
RESET
RUN
GAMEKILLER
JOYSTICK
PRINT
PRINTERS
CENTRONICS
SERIAL
RS 232
SCREENDUMPS
LARGE
SMALL
BANNER
COLOR PRINTERS
COMMODORE MCS
EPSON
SPECIALS
SPRITES
CHAR SETS
OK
CANCEL
PORT I
PORT II
MOUSE
AUTO FIRE

THE FINAL CARTRIDGE III®

Innovative hardware, combined with smart software, allow you to freeze and continue every well-known C64-program. Freezer options include:

CENTRONICS/SERIAL/RS 232 SCREENDUMPS

• Full A4 printing • Variable printsize • Color printing • Sprite printing • Reverse printing • Color changes.

GAMEKILLER

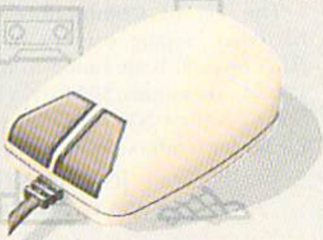
• Kills sprite to sprite • and/or sprite to background collision • Can be started at any point in your game.

AUTO FIRE

• Transforms a normal joystick to an advanced auto fire engine.

JOYSTICK PORT CHANGER

• Never blow up your computer again by changing joystick ports while the C64 is running.



BACK UPS

• Disk to disk • Tape to disk • Disk to tape • Back up files are packed and reloadable without the Final Cartridge III • 60K in 15 sec. (disk) • Exits to Monitor or Basic.

ML MONITOR

Comfortable ML monitor. Does not reside in memory. Functions include: • Scrolling up and down • 64K ROM/RAM access • Sprite editor • Character editor • Drive monitor • Fast loading and saving • Printer driver.

MAIL RUN

This month's letters feature reports on software, an rf shielding technique and screen magnifiers.

THE BIG PICTURE

I may have help for Catherine Firmin, who wrote in last November's Mail RUN about her difficulties in using a computer and her hope to find a screen magnifier. Independent Living Aids, Inc., of 27 East Mall, Plainview, NY 11803; 516-752-8080, offers a product called the Beamscope, a large rectangular lens made of acrylic and mounted on legs that, placed in front of a TV screen, magnifies it more than 50 percent. The blurb in the catalog says the Beamscope "provides exceptional color, brightness and clarity." There's a version for 10- to 15-inch screens ($57.95) and one for 17- to 23-inch screens ($67.95).

—JAMES M. MOSHER
TOPEKA, KS

Thanks for the tip! Such magnifiers were fairly common in the early days of television, when screens were very small.

Another reader, Amzi Warren of Proctor, Vermont, sent information on a very similar product called the Super Screen. Listed in Dr. Leonard's Health Care Catalog, the Super Screen accommodates 16- to 21-inch TVs and costs $29.95. Contact Dr. Leonard's at 74-20th St., Brooklyn, NY 11232 or call 718-768-0010.

Deborah A. Randall of Auburn, Maine, wrote to report that a support organization for handicapped persons called the Job Accommodation Network in Morgantown, West Virginia, had information about another screen magnifier. We spoke with Karl Marion of JAN who said the name of the magnifier is Compulenz, and it's available from International Marketing Services in Florida. Their phone number is 813-842-3231.

—EDITORS

SHIELDED SHELVES

After many months of trying to get Pocket Writer 2 from Digital Solutions to work on my C-128, I've finally succeeded. I believe my problem was their protection scheme, which makes any type of interference whatsoever inhibit the program. In their latest correspondence, after they copied Pocket Writer for me for the third time, they suggested that I move my equipment around until I found a location where the program would work.

Well, I have my hardware all arranged on shelves, so I didn't want to rearrange it to accommodate one program. However, their advice suggested another solution to me: installing rf shields on the shelves to isolate the units. I used aluminum flashing, which is readily accessible and easy to work with, and, attached to the underside of each shelf, it solved the problem.

If necessary, you could achieve even better protection by connecting the shields to each other with wire or strips of the flashing, then using a wire to attach the shield network to the ground receptacle in an ac outlet.

—PAUL P. YANTCHOOK
CHANTILLY, VA

The ground receptacle is the round third hole in more recent electrical outlets. Make sure you don't connect the shield to one of the rectangular receptacles—they're hot! You could also ground the shield to one of the outlet's faceplate screws. In fact, with an older two-hole outlet, you'd have to use a screw.

—EDITORS

ROCKLAND COUNTY REPAIRS

The list of Commodore-authorized hardware repair centers in the 1988 *RUN* Special Issue failed to include Kasara Microsystems, 33 Murray Hill Drive, Spring Valley, NY 10977; 914-356-3131. Please let readers know we're here.

—JOEL H. KORNREICH
KASARA MICROSYSTEMS

Done—and we're sorry about the omission.

—EDITORS

CP/M BOOKKEEPER

An "Editors" note in last October's Mail RUN invited comments from readers about CP/M programs they use. Here's my contribution.

I use a CP/M program called Checks and Balances from CDE Software to monitor my family's expenses and bank accounts, and I'm very pleased with it. It supports two disk drives and 80 columns. Data can be entered in any order; then the Sort command places it in correct sequence for fast retrieval and review.

The Total command calls screens that display account totals by year, quarter or month; cash flow; bills; profit and loss; and transaction types. It also displays missing and duplicate checks. The documentation is clear and supplemented by a sample data disk that I haven't even had to use yet. Checks and Balances is just what I needed in a domestic bookkeeping program.

— BRAHAM LATCH
MONTROSE, CA

We reviewed CDE's Checks and Balances in our February 1987 Software Gallery. The reviewer, Alex Lane, gave the program excellent marks also. For more information, contact CDE at 948 Tularosa Drive, Los Angeles, CA 90026; 213-661-2031.

—EDITORS

ADDED INPUT

I've been using Dome Accounting by Computer for the past six months and find the program easy to work with. However, it has a significant drawback that Walt Latocha didn't mention in his Software Gallery review last October. Nowhere in Great American Software's ads do they mention that the disk can be used for only one year or by one company. After you respond to the prompts on the set-up screen, the program writes the data to disk, then erases the set-up routine. Thus, you can't set up the program for another year or another company without buying another disk. Had I known about this copy-protection scheme, I would never have bought the program.

—LESLIE A. POLLAK
CHOMEDEY, LAVAL
QUEBEC, CANADA ■

Speed in Spades.

Throttle—*wide* open.
Joystick—back *hard*.

Air it out, man.

GeeBee Air Rally. Air racing action that puts the *wild* back in the wild blue yonder. Speed in spades. One tricky turn after another. And a lot of nasty competition between you and the finish line.

Buzz 'em. Bump 'em. Blow 'em away.

Show 'em who owns the skies.

16 unique courses, 4 special events, 256 levels of difficulty.

Bail out from a midair mishap, and you never know where you'll end up.

GeeBee Air Rally.
$29.95 suggested retail price for Commodore 64/128.™
$39.95 suggested retail price for Amiga™ computers.

ACTIVISION.

Ask your software retailer or order direct: just call 800/345-2888, operator 300.

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Circle 23 on Reader Service card.

SOFTWARE GALLERY

Start off the new year with reviews of graphics programs, a disk drive utility and warriors of land and sea!

Compiled by BETH S. JALA

GUILD OF THIEVES .... A+

A Chart-Topper Sequel To The Pawn

I've lately become skeptical of adventure games because I've seen so many come and go. With my own collection of fantasy/adventure games approaching 100 in number, it's difficult for me to get excited when a new program appears. When I received Firebird's Guild of Thieves, I saw no reason to become optimistic—that is, until I opened the box.

It's not Guild of Thieves' superb and often hilarious documentation that engaged me so, and I've seen better plots on the backs of cereal boxes. The joy of playing Guild of Thieves comes from the excitement of interacting with a program that has been so lovingly and expertly crafted that every aspect of it simply shines.

Welcome to the land of Kerovnia, where you've applied for entrance into the Guild of Thieves, better known as the Worshipful and Partially Honourable Guild of Professional Nocturnal Surreptitious Entry and Removal Operatives. Before you can be admitted into the Guild, you must successfully complete a test that entails plundering a castle and the surrounding countryside, pillaging practically everything that doesn't walk or isn't nailed down. No easy test, to be sure.

Before you begin, you must first read "What Burglar," an old gazette that is supplied with the game. Aimed at the professional thief, the gazette is reminiscent of a seedy club newsletter. In it, you'll find the playing instructions, several humorous news stories, an interview with the Guild's founder, Rhino Q.Q. Thrushwhaker III, classified ads and a useful hints section.

Several interesting props are also included: a Guild contract (suitable for framing), playing die and a plastic credit card.

You move about and communicate with the story by using English words and phrases. The game's powerful parser can understand varied and complex compound sentences, and gives you the ability to converse and interact with a lot of the characters within the story. Additionally, the parser understands many standard abbreviations, such as "L" for look, "I" for inventory, and so on. I was intrigued by how infrequently the program questioned my commands, as if every move was anticipated.

Graphically, Guild of Thieves offers dozens of exciting high-resolution depictions that help guide you along your surreptitious path. You can select an option that displays a full graphic screen the first time a new area is entered, and a small cameo picture on subsequent visits. This cameo is a capsulized version of the full view, displayed out of the way of the main text. Graphics can be scrolled up or down to suit your tastes. With the graphics enabled, you'll be prompted to swap disks quite a bit. Using the function keys, however, you can disable the graphics, thereby reducing disk access and swapping. Perhaps, in future releases, the authors will take into consideration those of us with two disk drives.

To complete the game, you must collect all of the treasures available, while solving the puzzles associated with them. You can resort to the "hint" command for a particularly tough problem, but you might regret your lack of patience for not thinking of the solution yourself.

Guild of Thieves takes a lighthearted and fascinating approach to a tired genre. It's an intriguing, thoughtfully crafted game that doesn't take itself too seriously. If I had to throw away all but one of my own adventure games, Guild of Thieves would be a top contender for the one I would keep. *(Firebird, PO Box 49, Ramsey, NJ 07446. C-64/$39.95.)*

—JOHN RYAN
BILOXI, MS

MANIAC MANSION ...... A+

You'll Experience Laughter Fear, Victory, Bewilderment —And Fun!

It takes a great deal of effort to produce a highly successful piece of entertainment software in today's competitive market. A product must be professionally crafted, innovative, replayable, and seed you with the desire to return to it time and again. These are facets that not all software houses can measure up to, unless of course, you happen to be Lucasfilm, whose release, Maniac Mansion, possesses all of ►

REPORT CARD

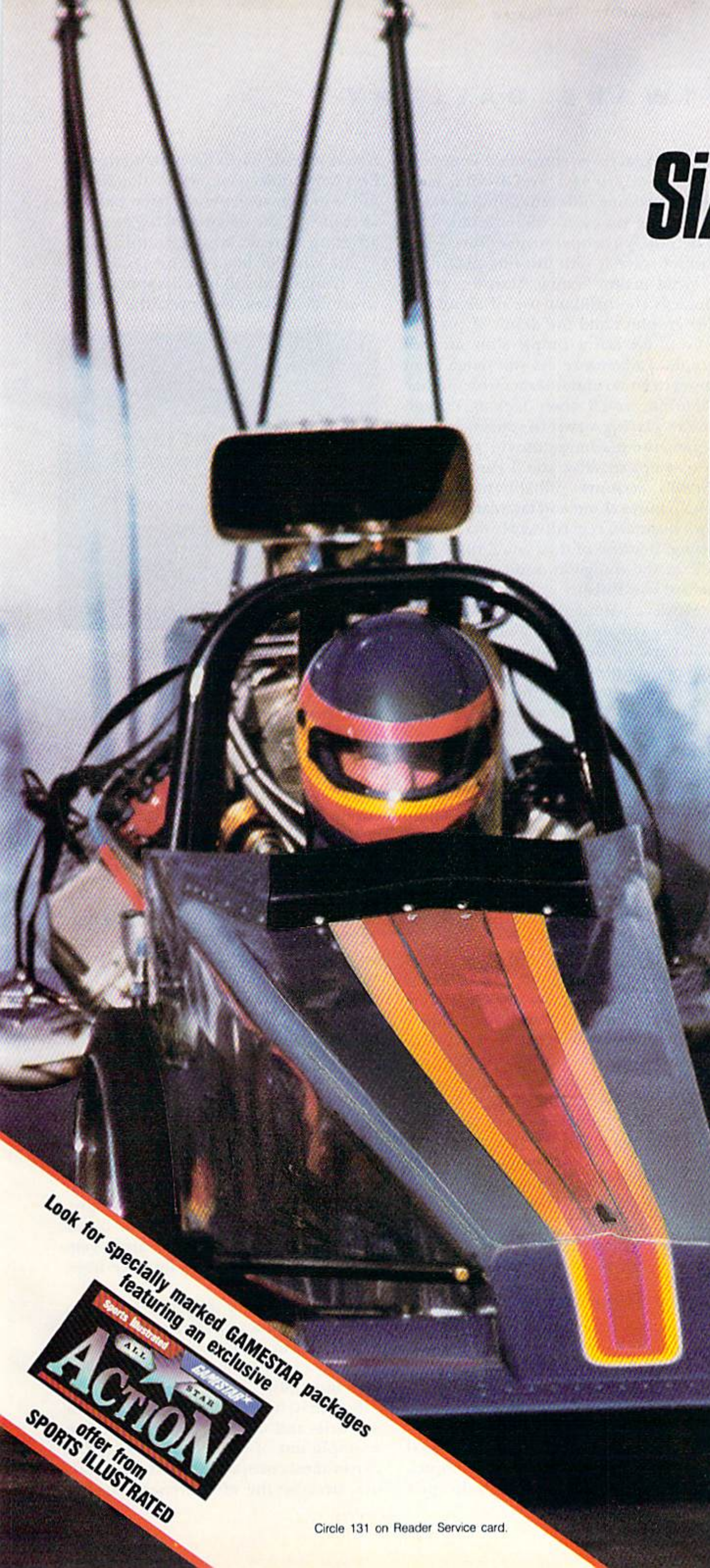
A Superb!
An exceptional program that outshines all others.

B Good.
One of the better programs available in its category. A worthy addition to your software library.

C Average.
Lives up to its billing. No major hassles, headaches or disappointments here.

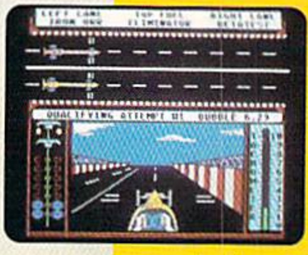
D Poor.
This program has some problems. There are better on the market.

E Failure.
Many problems; should be deep-sixed!


Look for specially marked GAMESTAR packages featuring an exclusive
Sports Illustrated
ALL STAR
GAMESTAR
ACTION
offer from SPORTS ILLUSTRATED

TOP FUEL ELIMINATOR™

Six Seconds of Pure Power


LEFT LANE
TOP FUEL
ELIMINATOR
RIGHT LANE

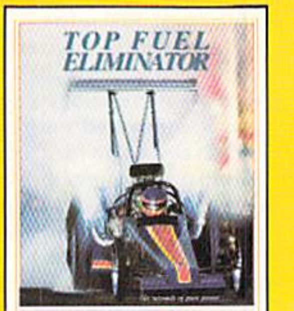
The track's fast and your opponent, tough. You added just enough nitro, cranked up the blower, and now 2,500 raging horses await your split-second reactions. Will you blow the other guy away for the season championship, or just go up in smoke?

You face new challenges at each stop during the 9-event season. Every round of qualifying and races pits you against the world's top drivers. Choose the best set-up for track and weather conditions, then slide behind the wheel for a gut-wrenching ride to glory.

All the sights, sounds and exhilaration of big-time drag racing are waiting… *if* you can handle it.

Available for Commodore 64/128™ and Apple® II series computers.

GAMESTAR★


TOP FUEL
ELIMINATOR
GAMESTAR

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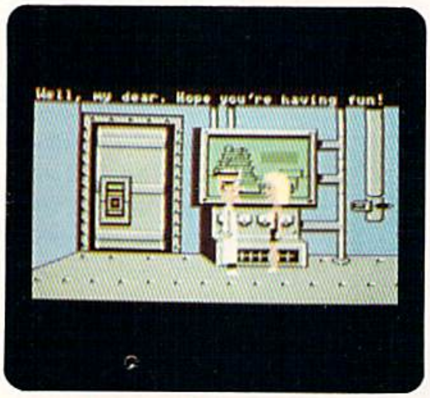
these qualities, and more!

Maniac Mansion could be labeled as a graphic adventure game, although that particular term would do it a great injustice. The program is better thought of as an event, where emotions like triumph, delight, fear and frustration are brought out in full force.

This is a 3-D adventure as you have never experienced before. You are Dave Miller, popular student and local all-American boy-next-door. Your girlfriend, Sandy, has been kidnapped by the dastardly Dr. Fred, a psychopathic scientist who lives in an old mansion on the hill. Dire events are in store for Sandy unless you can save her. To do this, you choose two other teenagers from a pool of seven local boys and girls. You'll find that each teenager possesses special talents that can help or hinder you when you're trying to solve some of the puzzles within the house.



Well, my dear. Hope you're having fun!

Maniac Mansion's Doctor Fred insists on threatening Sandy.

Expect to interact with the house's demented inhabitants—Nurse Edna, an old gal with an oversized libido; Weird Ed, a teenage commando with a thing for hamsters; then there's dead cousin Ted; and let's not forget the dreaded tentacle and . . . oh well, you'll get the point when you play this magical and captivating adventure.

This game is different from all the others of its genre in one important respect—there's no typing involved! Action is controlled entirely by joystick. The screen is divided into three main sections: the command line, the information line and the main graphics screen—your window to the world of Maniac Mansion. Each player is controlled by moving the joystick arrow to a location and clicking the joystick button. Objects displayed on the screen can be picked up, used, pushed, pulled, and so forth, by a simple point-and-click method.

Each player is controlled independently, and, in fact, you'll often have each one doing different things in many of Maniac Mansion's 55 locations. This is definitely a cooperative venture—you cannot solve it with just one player.

What makes Maniac Mansion really shine is the brilliant use of simulated 3-D graphics and the depth of play involved. It's not a simple show-and-tell graphics adventure. As you move from room to room and interact with Maniac Mansion, you'll soon feel as though you're playing a part in some teenager-versus-the-madman movie script. If you're not stealthy, you'll run into the house's eccentric inhabitants, all of whom move about and take care of their own business, regardless of what you're doing! Because of this, you'll find yourself in the dungeon quite a few times before you finish.

However, Maniac Mansion is not one of those cut-and-dried adventures. You won't end up dead or out of play if you make a simple mistake, and there are several ways to finish the game.

Every so often, the action stops while "cut scenes" are introduced. These are like movie clips, where you can observe Dr. Fred, Edna, and Weird Ed in actions that might offer clues to aid you in your rescue effort. These scenes also help you keep track of what the house's inhabitants are up to. For example, by calling Nurse Edna on the telephone in the library, you can watch her answer it in her own room during the cut scene.

Everything about Maniac Mansion is big budget. From the superb sound track to the opening credits, it breaks down the traditional computer-player interface and places you in another world. And, in this movie, the script can be written several ways, depending on how you want to solve the adventure.

I found Maniac Mansion to be one of the best entertainment packages available, and I think you will, too. *(Lucasfilm; distributed by Activision, 2350 Bayshore Parkway, Mountain View, CA 94043. C-64/$34.95.)*

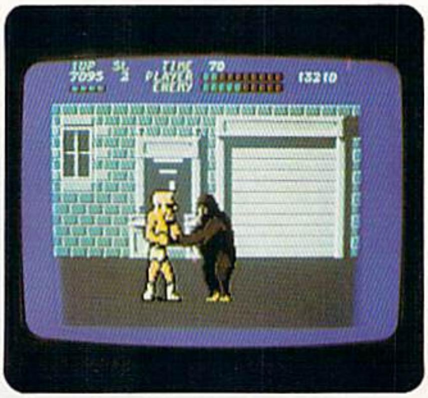
—John Ryan
Biloxi, MS

BOP'N RUMBLE .... B+

It's Rough 'n' Tumble Action On the Streets!

Like Rocky Balboa, another fictional ring warrior is returning in a sequel. Gorgeous Greg, the hero of Mindscape's Bop'n Wrestle, faces more challenges in Bop'n Rumble. But, while the Rocky follow-ups have generally been panned as copies of the original, Greg's second adventure breaks fresh ground.

The wrestler has kept his gold spandex trunks and still uses his spectacular wrestling moves. However, the option of competition between two human players has not been reproduced. A more positive change from the original format is the grappler's departure from the arena into a city that's overrun by bizarre thugs.



Don't let those creeps take over the city in Bop'n Rumble.

The brief instructions deliberately give little detail about the game's ten levels. In each of these stages, one or two players score points by using a joystick or the keyboard to successfully guide Greg through a dangerous neighborhood. Throughout the contest, the wrestler can duck, jump up, walk and leap to the left and right. He also has four attack moves, which are different on each level. For example, the computer input that produces a head butt during stage one generates a knee to the chest during the third round of play.

The characters that Greg meets also vary from level to level. A motley bunch they are, from bulldogs and gorillas to flashers and stick-wielding punks. With few exceptions, they attack on sight, either singly or in pairs. If their blows strike home, Greg weakens and eventually dies. When he has lost five lives, the game ends.

Bop'n Rumble's graphics are crisp and colorful. Its sound effects not only include the mandatory splats and thuds, but also a jazzy theme that plays during lulls in combat.

Fortunately, the game is more than just bells and whistles used to decorate a simple test of reflexes. To succeed, a player must constantly develop new tactics, because the effectiveness of each ►

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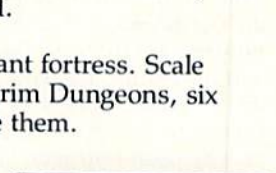
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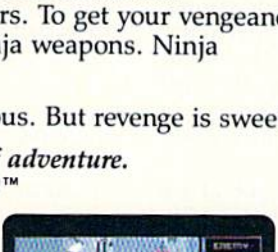
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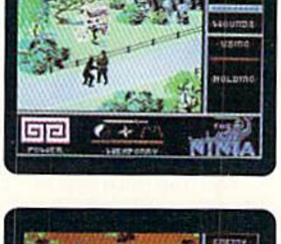
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possible move varies with different circumstances. For instance, some of Greg's blows are most powerful when delivered from a distance, while others are best for combat at close quarters. Having to puzzle out the appropriate action for each situation adds spice to the contest.

However, the software is not perfect. For one thing, its continuous violence will repel some players. Also, the program doesn't save updated versions of its high score screen to disk for viewing during future games.

But players who relish heroic arcade battles should still enjoy Bop'n Rumble. It offers a heady mixture of tactical choices and nonstop action. *(Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. C-64/$29.95.)*

WALT LATOCHA
OAK PARK, IL

PIRATES! .... B+

Yo, Ho, Ho and A Bottle of Rum, Matey!

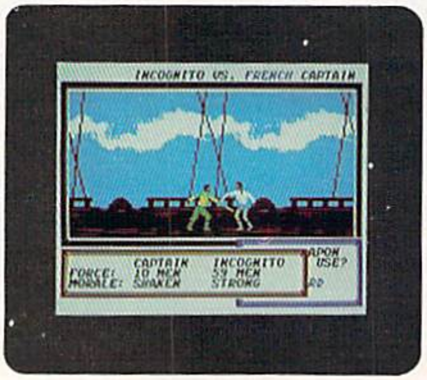
Sid Meier is probably best known as the creator of F-15 Strike Eagle, MicroProse's jet combat simulator that puts you in the cockpit of one of the most powerful and technologically advanced fighter planes in the world. Meier has turned his attention away from the high-tech world of jet fighters and toward the Spanish Galleons, treasure fleets and swashbucklers who sailed the Caribbean during the 17th century. Pirates!, an unusual blend of action and adventure, lets you sail back into this romantic period as an English or French buccaneer, a Dutch adventurer or a Spanish renegade.

The nationality you select as you begin your new career helps to determine the starting point of your adventure, the types of ships you'll sail, the size of your crew and, to some extent, the kind of reception you'll receive when you enter a new port or encounter other ships at sea.

You can also choose any one of six historical periods, from 1560 (The Silver Empire) to 1680 (Pirates Sunset). Each time period presents unique challenges and opportunities for fortune and adventure. For advanced players, Pirates! even gives you the option of commanding a famous expedition. For example, you can recreate the 1573 Silver Train Ambush as Francis Drake or play the part of John Hawkins in the 1569 Battle of San Juan de Ulua.

Pirates! is played entirely with a joystick; in fact, even menu selections are made by moving a flashing cutlass-shaped cursor over your option and pressing the fire-button. While travelling across the Caribbean, the joystick is used to steer your ship, but your swiftness depends on the speed and direction of the wind. When your lookout spots a sail on the horizon, you can either continue your voyage or investigate, in which case you'll be told the type of ship identified and the flag it's flying.

During battle, you can defeat the other ship by inflicting so much damage with your cannon that the enemy surrenders, or by pulling up alongside, boarding it, and dueling it out with swords. Here, various combinations of attacks, parries and slashes can be combined as you wield your choice of longsword, cutlass or rapier.



Shiver me timbers and blow the man down in Pirates!

Pirates! is not simply a simulation of naval battles and sword fights. Much of the game's character comes from your experiences on dry land. When you enter a town, you can visit the local tavern and interact with its patrons, pay a call on the governor, who may grant you special privileges in exchange for your services as a mercenary, or check on your personal status and the general status of your crew. You also have the additional options of dividing up your plunder and retiring, trading goods and ships with local merchants or saving the current game to disk.

Pirates! comes with a map of the Caribbean that shows the locations of the more than 50 towns you can visit. The clearly organized, 88-page manual gives you game instructions, with a wealth of historical information on colonial life during the 17th century and the ships of the period.

Although Pirates! may never achieve the block-buster status of MicroProse's F-15 Strike Eagle or Silent Service, it's clear that just as much research and hard work went into its development. The result is a well-designed game that is certain to please anyone fascinated with pirates and their time in history. *(MicroProse, 120 Lakefront Drive, Hunt Valley, MD 21030. C-64/$39.95.)*

—BOB GUERRA
SOUTH BOSTON, MA

THE GRAPHICS TRANSFORMER .... A+

A Program That Performs More Switcheroos Than a Magician!

Slowly but surely, software programmers are realizing that there are a lot of Commodore computerists who'd like to be able to exchange high-resolution pictures among various drawing and printing programs. I've seen some very nice packages that help accomplish this transfer, but usually only for a handful of programs. With CDA's Graphics Transformer, you can convert files from over 20 different products, including GEOS, Print Shop, Koala and Doodle!.

The very best part of The Graphics Transformer is that the process is flexible enough to convert files from any of the programs supported to any of the other file types.

The instruction booklet is short and to the point, which is all that's needed, because on-screen prompting is very clear. The simple operation of the program shields the very complex tasks of conversion from the user.

The program uses a fast disk I/O routine that borders on the incredible. I tested the package on a C-128 (in 64 mode) with two 1571 disk drives. I've never seen anything work faster on my system.

CDA has included a full disk utility option just in case you need it. The Graphics Transformer is so complete that it even reads in the disk directory for you.

The conversion process begins by highlighting the files you want to convert. A header at the top of the screen displays all kinds of useful information, such as disk name and ID, blocks free and used, number of files on disk, number of files selected for conversion, disk drive status and the source and destination drive numbers. The Graphics Transformer fully supports dual disk drive operation.

During conversion, you're given a va- ►

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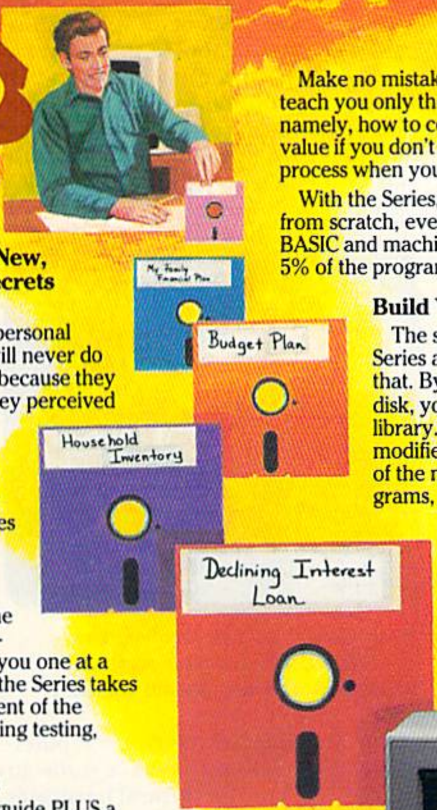

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riety of choices to enhance or change the picture. You can strip the image of color; flip the picture horizontally, vertically or both; change bit colors; or scroll the picture, one pixel at a time, in any direction. If at any time you do something that results in an unacceptable image, there's a restore option.

When I tried converting some of my own pictures, I was reminded of something you should keep in mind. As you begin converting pictures, you might not get the result you expect. At first, you may think it's a program problem. In reality, you might have done something in the original picture that's coming back to haunt you. For example, I had a high-resolution picture of my company logo. In using Koala Painter, I had "painted" some pixels the same color as the background. It looked fine, but from a storage standpoint, the individual pixels I changed were stored as part of the high-resolution image, whereas the background color was stored only once. In conversion, the result can be somewhat different.

The CDA package also automatically takes care of formatting the name of the converted file to work with the package you've specified.

The Graphics Transformer has a few more tricks up its sleeve. Images can be converted to a "stand-alone" file. The instructions refer to it as "a compressed, autobooting, fast-loading" file of your picture. If you're interested in game programming and wish to create your pictures using the drawing program of your choice, you can then use the Multi File option to create three individual files—bit map, screen and color (for multicolor only) memory.

If you're in a position where you often want to transfer pictures from one program to another, The Graphics Transformer is a virtual must for your collection of software utilities. It is extremely well done. *(CDA, Inc., PO Box 1052, Yreka, CA 96097. C-64/$34.95.)*

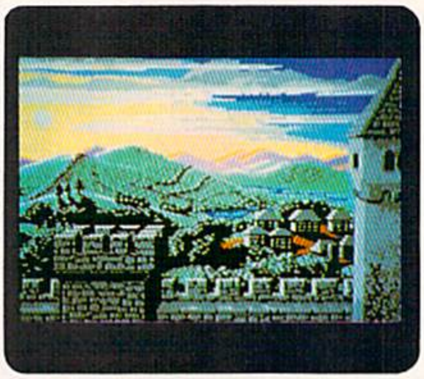
—JIM GRUBBS
SPRINGFIELD, IL

DEFENDER OF THE CROWN .... A

It's Almost Like Playing Camelot On Your Commodore

Fortunately for C-64 owners, many of the same breathtaking aspects that are seen and heard when Defender of the Crown runs on the Amiga can be perceived with Mindscape's recent conversion of the program to C-64 format. But Defender is more than just another pretty face. Set in 13th century England and termed an "interactive movie," it's actually a strategy contest that combines elements of role-playing games with action sequences.

At the beginning of Defender, you choose your character from one of four Saxon lords—Wilfred of Ivanhoe, Wolfric the Wild, Geoffrey Longsword or Cedric of Rotherwood. Each lord is rated for his skill in leadership, jousting and swordplay, and much of the game's strategy comes from knowing the strengths and weaknesses of the other lords, and using this information to your advantage on the battlefield. To survive, you must be able to hold your own, not only against two of the other Saxon lords, but also against three Normans.



In Defender of the Crown, the countryside looks peaceful, until your lord and his sword appear.

You and each of the five computer-controlled lords are given a castle in one of 18 territories. Neutral territories can be seized simply by moving troops into them, but capturing a territory under another lord's control requires fighting it out on the battlefield. Here you can stand and fight, attack ferociously, bombard the enemy with your catapults, outflank the enemy or retreat.

No matter which strategies you select from the on-screen menu, the winner of the battle is often the lord with the largest army. Every territory you control contributes vassals to help you fight your battles and gold you can use to buy soldiers, knights, catapults and castles.

One way to gain additional gold is by raiding an enemy's castle. In perhaps the game's best animated sequence, you use your sword to fight your way past the guard in the enemy's torch-lit courtyard, enter the castle and continue to duel with the captain of the garrison until you force him to the top of the stairs where you can finish him off. When you do, you'll be able to enter an inner chamber that contains the store of gold.

The joust, another one of the game's action sequences, occurs whenever you or one of the other lords calls a tournament. Amid much fanfare and pageantry, you mount a steed and charge toward your enemy with your trusty joystick-controlled lance. Although I've never been successful at the joust, the idea is to unseat your enemy by striking him in the center of his shield. Here again, winning has a lot to do with the preset jousting ratings possessed by both you and your opponent.

Defender of the Crown was one of the first adventure/strategy games to be released for the Amiga, and the game's stunning images of torch-lit castles and beautiful damsels, along with a great musical soundtrack, helped to convince many people of the machine's graphic and sound potential. With the conversion of Defender to C-64 format, its designers have done an excellent job of reproducing these now-familiar images without sacrificing much of the original detail. More important, the game still features the same combination of action, adventure and strategic depth that keeps things interesting once you get your breath back. *(Cinemaware; distributed by Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. C-64/$34.95.)*

—BOB GUERRA
SOUTH BOSTON, MA

PRESIDENT ELECT .... B–

And If I'm Elected, I Promise To . . .

No matter what I do, the candidates I like lose. This suggests that either my judgment or the country is in trouble. But I have to admit that SSI's 1988 Edition of President Elect is fun, engaging and, yes, educational.

President Elect, a tactical political simulation for one, two or three players, lets you simulate, in approximately 60 minutes or so, any nine-week presidential campaign from 1960 to 1988. Using historical, potential or imaginary candidates, you can choose and plan campaign strategies for Republican, Democratic or third party hopefuls, or let the computer run the operation.

If you choose a candidate other than one of the 69 (the documentation claims 72, but I count three less) already in the computer's database, you have to rate the candidate on various issues to ►

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establish his or her degree of liberalism or conservatism. From there, you can rate attributes like magnetism and speaking ability.

At the start of the game, the computer establishes the political climate of a specified year. For a 1988 simulation, the manual suggests economic and political input that you can alter.

If you, and not the computer, are managing the election, you must allocate your resources among national, regional and key-state campaigning. If the candidates agree to debate, you control their responses to computer-generated questions. At the end, you can choose to view the election returns minute by minute or instantaneously.

The game is easy to learn—a relatively well-organized manual helps explain screens and prompts that might seem incomprehensible at first. The documentation presents notes on strategy and useful political and historical information.

An intelligent playing of the simulation, however, requires some political and current events knowledge—for example, the current rate of GNP growth or the meaning of the NAACP agenda. After all, the more accurate the information, the more value the game has as a predictor.

And how accurate, in fact, can this simulation be? It doesn't take into account all important variables. For instance, the only attribute of a vice-presidential candidate that's noted is geographic region—sex, race and religion are ignored.

The design of the game also limits your control of the variables. There are times when world events might inspire you to change your mind about an option such as a trip abroad, yet there is no way to alter a previous choice without rebooting.

The play itself is both engaging and frustrating. Various screens include weekly polls, data on campaign stops, debate questions, colorful maps reflecting weekly standings, and election night projections. There's a lot of wait time, however, especially in the week-by-week campaigns managed by the computer. Some patriotic music, waving flags, historical facts scrolled across the screen, or even dancing elephants and donkeys would add interest.

Nonetheless, this game has unquestionable educational value for high school and college students, as well as for adults. The simulation, in conjunction with the documentation, presents the nuts and bolts of campaigning, and historical as well as political information. It fosters decision making and critical thinking skills.

The initial version of the game, issued in 1981, correctly predicted Reagan's 1984 landslide. President Elect, 1988 Edition, predicts a closer race. To find out which party is most likely to win, play the game. Maybe someone can discover a strategy to let the good guys win! *(Strategic Simulations, Inc., 1046 N. Rengstorff Ave., Mountain View, CA 94943. C-64/$24.95. Owners of the original version can receive this edition by sending in the old disk with $10 plus $2 shipping and handling.)*

—Sharon Weiner
Chicago, IL

1541/1571 Drive Alignment .... B

Straighten Out and Get Those Disk Drives On the Right Track

What goes "rattle, klank, thud," is a few inches high and is found next to many Commodore computers? The answer, of course, is Commodore's 1541 disk drive. Its younger cousin, the 1571, can also be located there.

Why is the 1541 so cantankerous? According to Free Spirit Software, when a particular track on the disk isn't where the microprocessor in the drive thinks it ought to be, it repositions (read that: smacks the heck out of) the head by hitting it against the stop assembly, thereby putting it out of alignment.

Some software companies, in their quest for the perfect software protection system, deliberately introduce errors onto their disks. These errors also encourage the disk drive to perform such repositioning.

Owners of the 1571 are slightly more fortunate. A photo-electric cell helps to handle such situations a bit differently. Still, some disk errors will make the 1571 render a gut-wrenching clatter. I know; I had one that did just that.

The 1541/1571 Drive Alignment program might be just what you need if you have a similar problem. It did the trick for me.

From an operational standpoint, the program couldn't be easier to use. On-screen instructions walk you through the testing procedure, which lets you check head alignment for any track on the disk, including half-steps. A speed check can also be performed. This program not only tells you what it finds, it gives you a quality rating, in plain English.

Armed with information on the condition of your drive, you can then elect to align the drive. (Caution: This isn't for the faint of heart.) The second side of the program disk contains a precision track alignment signal. The program can align the 1541, 1541C and 1571 drives, and also the drive in an SX-64. The degree of difficulty in making the needed adjustments varies from model to model. It's relatively simple on the 1541 series. The 1571 can be a bit more challenging, depending on which production model you have, and the SX-64 can prove very difficult.

I got my 1571 back into alignment, but it's not a task I suggest for a beginner. That's not the fault of the software, but rather a function of the hardware. If you're too timid to do the alignment yourself, the program can still be used as a diagnostic aid to periodically check the health of your drive. When it starts getting bad, you might want to take it into your Commodore service center for adjustment.

A brief, eight-page manual adequately describes the procedure and the operation of the program. The drawings appear to have been made using some sort of simple computer-assisted drawing program, and they could be much clearer than they are.

Be sure and read the instructions regarding the 1571. It will always fail the head stop test because of the electronics that won't let the 1571 head move to track zero. Also note that off-speed conditions can be easily corrected on the 1541 series, but the 1571 offers no such adjustment.

If you are moderately talented with tools, Free Spirit's 1541/1571 Drive Alignment and a steady hand are all you'll probably need to put your disk drive back in tip-top shape. *(Free Spirit Software, Inc., 538 S. Edgewood, LaGrange, IL 60525. C-64, C-128/$34.95.)*

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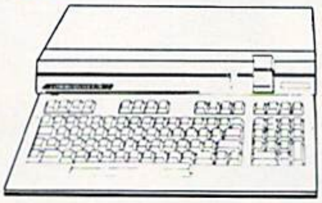

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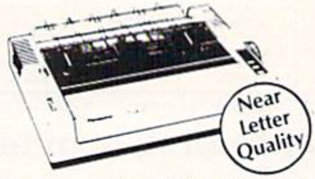

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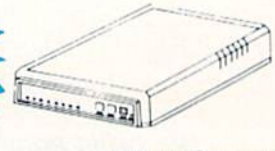

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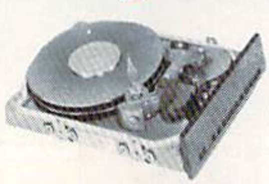

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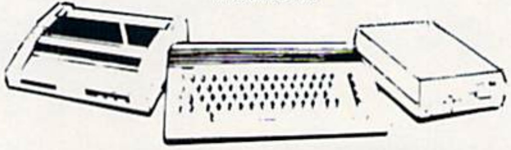

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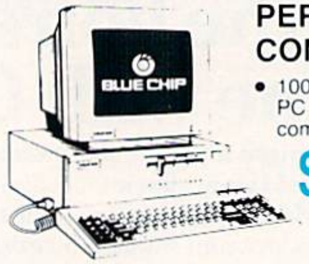

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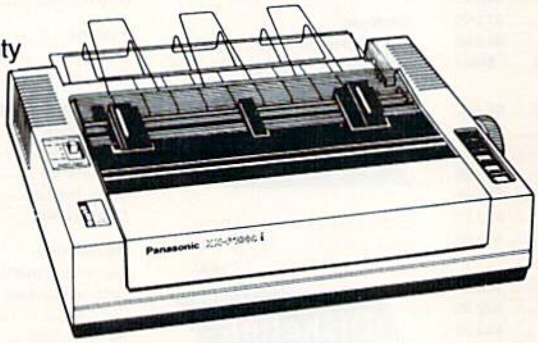

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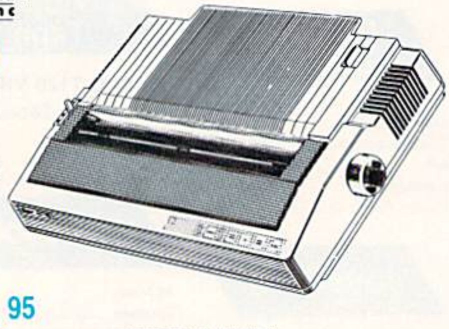

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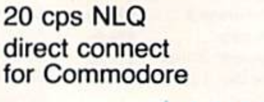

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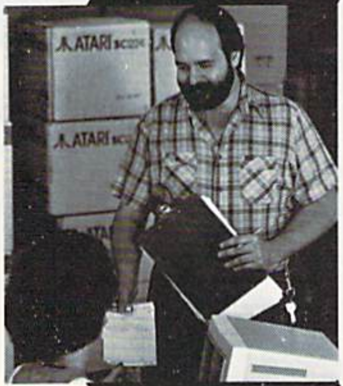

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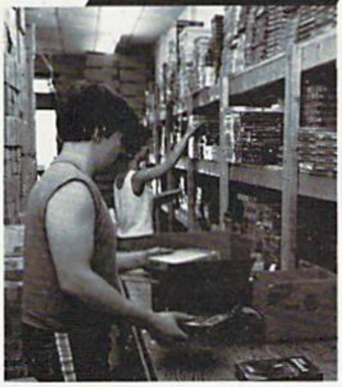

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Resolutions:
R.Kenton Nelson

A Happy New You!

Make your 1988 resolutions easier to keep with the wide range of self-help software available for Commodore computers.

By LONNIE BROWN

HOW COULD I use my C-64 to better manage my life?" I mused aloud. My wife had an immediate answer: "Sell it and buy a home-exercise unit, spend Saturdays working in the yard instead of visiting with computer buddies and use those floppy disks for coasters, so the drink glasses don't leave water rings."

Ohhhh, me! Sitting in front of the computer has gotten me into this mess. Can it also get me out? Well, bless its little microchip, it can. There's light at the end of the cathode-ray tube.

Type faster. Drive better. Cook gourmet foods that will expand your waistline, then contract it through exercises. Prepare for the SATs. Draw up a will. No matter what your goal, there's probably C-64 software to help you reach it. Computer programs can not only help you learn, but can also provide the incentive to keep your self-improvement resolutions.

TO YOUR HEALTH

Let's face it: Typing in *RUN* magazine programs isn't really making your cardio-vascular system healthier, is it? But your Commodore can improve your heart and circulation in other ways. According to Bob Bowden, a developer of personal health programs, teaching about health and monitoring exercise are tasks that the computer is good at.

Said Bowden, "A computer can be a big incentive to start an exercise program and a help in keeping track of it. The computer can also help keep you motivated through the first 28 days of an exercise regime—the period when you're most likely to lose interest."

Bowden's Exercise Tracker is a program with few bells and whistles, but lots of useful information. It can figure the range of heartbeat rate that'll give you the most benefit from an exercise ►

ILLUSTRATION BY R. KENTON NELSON

> *The program also lets you record your mood at mealtime, since moods affect eating patterns.*

session. For outdoor activities, it can calculate heat and chill indexes, taking into account humidity and wind speed, both of which influence the way the temperature affects your body. Based on your weight and the duration of your exercise sessions, the program will also calculate calories burned and keep a monthly total; and, if you bike, walk or jog, it will log the distance you cover and represent it on a map as if you were crossing the U.S.

Bowden's other programs include Vitamin Advisor, which outlines what vitamin supplements you may need, and Planning Tanning, which helps you achieve a beautiful tan with brief exposure to the sun, instead of the usual blister-and-peel method.

He's also written a program for teenage boys called For Ectomorphs Only. Ectomorphs are those lucky people who can eat everything in the refrigerator without becoming the size of one. "Some young boys turn to steroids to build their bodies," Bowden said. "This program provides a natural way to gain weight and strength."

WATCH YOUR STEP!

Computers can really keep you on your toes—in fact, you can put a computer on your toes! Puma's RS-Computer Shoe features a built-in computer that calculates how many steps you've run, your elapsed time and how many calories you've burned. At the end of a run, you can place the shoe's memory on hold until you have a chance to dump it to a C-64. Saving the information to disk lets you monitor your daily, monthly and yearly progress in graphic form. You can also tell your sole-mate how far you want to run; then, when you've covered the specified distance, it beeps to alert you.

COUNTING CALORIES

The Original Boston Computer Diet, from Mindscape, is a well-balanced and respected diet/exercise program. Its nontechnical manual provides a clear understanding of what calories are and why your body turns some of them into fat, and the program comes with a database for keeping track of the calories in your diet. The program also lets you record your mood at mealtime, since moods affect eating patterns. The diet includes foods from six basic groups and encourages food swapping to prevent diet boredom.

When it comes to diet and health, keep in mind, too, that spreadsheets like *RUN*'s own RUN Calc provide an easy way to keep track of exercise, monitor calorie intake and perform the calculations associated with weight control.

FINE TUNING

Disk-based instruction for stringed instruments can't replace teachers, books and records, but it can provide a change of pace and increased incentive.

DJ Software's Easy Guitar, for beginners, offers a computerized pitchpipe, an exercise to help you develop a sense of pitch, 50 chord diagrams, an adjustable metronome and a built-in rhythm section. An included quiz helps you assess your progress, as does a video game that tests chord knowledge.

According to its packaging, Guitar Wizard, from Baudville, is designed to help intermediate and advanced players "fine-tune their play." The Chord Wizard section displays and prints out the different locations of chords on the guitar's neck, while Scale Wizard does the same for scales. Fretboard Wizard displays or prints the chord and scale pattern at the same time, and Improvisation Wizard helps you create improvised solos by suggesting notes to play with various chords. The program also includes sections on music theory and technique.

THE CHIPS ARE DOWN

With casinos using computerized poker machines, Applications Plus has come out with a program called Vegas Video Poker, which is designed to improve your chances of drawing good hands at computer poker. In computer poker, the goal is to get a hand with a pair of jacks or better, so you can win back even money on your bet. The graphics are plain, but the emphasis is not on arcade-type action, but on learning how to play the odds to your advantage.

The machine lets you discard and draw up to five cards to improve your hand. Using computers, Vegas Video programmers analyzed the outcome of various discard options as many as 25,000 times, then converted the results into payback ratios to see which options would return the most money to the player. For instance, given a mismatched hand with a jack as the high card, should you discard the whole hand? The Vegas

Video experts say no—hang on to the jack. Tossing out all five cards produces a payback ratio of 33 cents on each dollar bet; starting with a jack increases the probability of drawing a pair and results in a payback ratio of nearly 50 cents on the dollar.

IF YOU'RE A CHESS NUT...

While poker mixes skill and luck, winning at chess depends on skill alone. You can increase your skill with Enlightenment's Paul Whitehead Teaches Chess, one of the best chess instruction programs available. More than 60 hours of instruction are included on the program's three disks, and at any point you can exit the instruction boards to test yourself on the Coffeehouse Chess Monster, a computer chess game with nine skill levels. Enlightenment also distributes Jeremy Silman's Guide to Chess Openings.

DRIVING THE POINT HOME

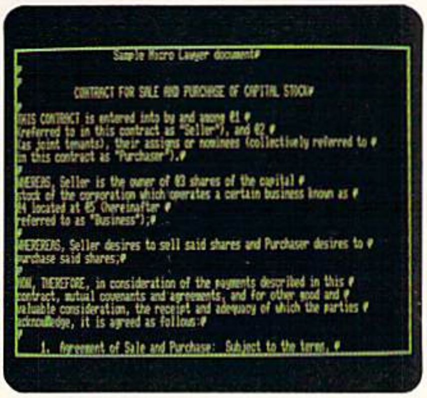
As the program points out, Keys to Responsible Driving, developed by CBS Software and distributed by Mindscape, is no substitute for a driver education course. However, the nine self-paced sections will augment a real-life course. The sections cover handling a vehicle, traffic signs, regulations, how stress and drugs affect responses, and so on. Pretests determine how much you already know about a subject; posttests determine how much you've learned.

The two-disk program also produces pictures of driving situations you might encounter and displays stopping distances and reaction times in the form of bar graphs. For instructors, it keeps a list of students and their progress.

CHEERS!

Concept Development Associates has computerized the mainstay of the bartender's bookcase in Mr. Boston's Official Micro Bartender's Guide. The printed guide has been published in 62 editions over a 50-year span, and more than nine million copies have been sold. The electronic version comes with more than 1000 drink recipes, a complete wine-selection list, descriptions of beers of the world and provision for adding recipes or changing them to suit your taste.

If you're expecting a crowd of 500 for cocktails, no problem. Mr. Boston will quickly determine the proper proportions for one to 999 servings of any drink. It can also search for drinks by various parameters, including name and main ingredient; lets you note which drinks your friends like and recall the list later; and prints out recipes and a shopping list covering liquor, mixers and glassware. An abridged version of the program is also available. ►



```
             Sample Micro Lawyer document¶
¶
¶
        CONTRACT FOR SALE AND PURCHASE OF CAPITAL STOCK¶
¶
HIS CONTRACT is entered into by and among @1 ¶
referred to in this contract as "Seller"), and @2 ¶
as joint tenants), their assigns or nominees (collectively referred to ¶
n this contract as "Purchaser").¶
¶
HEREAS, Seller is the owner of @3 shares of the capital ¶
tock of the corporation which operates a certain business known as ¶
4 located at @5 (hereinafter ¶
eferred to as "Business");¶
¶
HEREREAS, Seller desires to sell said shares and Purchaser desires to ¶
urchase said shares;¶
¶
OW, THEREFORE, in consideration of the payments described in this ¶
ontract, mutual covenants and agreements, and for other good and ¶
aluable consideration, the receipt and adequacy of which the parties ¶
cknowledge, it is agreed as follows:¶
¶
   1. Agreement of Sale and Purchase:  Subject to the terms, ¶
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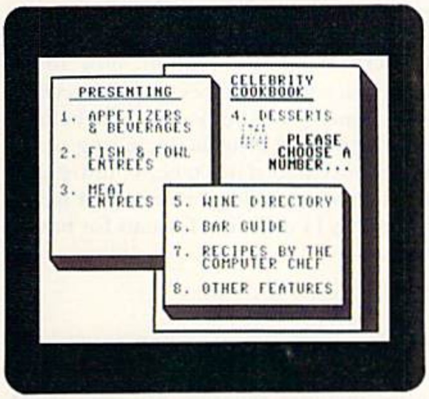
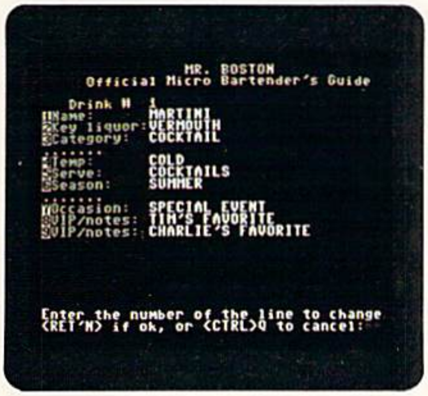
The sort of document Micro Lawyer can produce.



Celebrity Cookbook's menu leads you to a host of delicious recipes.



```
              MR. BOSTON
   Official Micro Bartender's Guide

   Drink #    1
 1Name:       MARTINI
 2Key liquor:VERMOUTH
 3Category:   COCKTAIL
 .......
 4Temp:       COLD
 5Serve:      COCKTAILS
 6Season:     SUMMER
 .......
 7Occasion:   SPECIAL EVENT
 8VIP/notes:  TIM'S FAVORITE
 9VIP/notes:  CHARLIE'S FAVORITE


Enter the number of the line to change
<RET'N> if ok, or <CTRL>Q to cancel:
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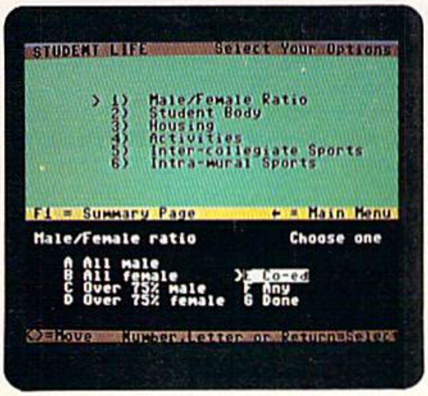
Mr. Boston's Guide tells you all you need to know about potent beverages.



```
STUDENT LIFE            Select Your Options

          > 1)  Male/Female Ratio
            2)  Student Body
            3)  Housing
            4)  Activities
            5)  Inter-collegiate Sports
            6)  Intra-mural Sports

F1 = Summary Page               ← = Main Menu
Male/Female ratio                  Choose one

    A All male
    B All female        >E Co-ed
    C Over 75% male      F Any
    D Over 75% female    G Done

<>=Move    Number,Letter or Return=Select
```

Searching for the Perfect College?

. . . maybe your typing's terrible. Well, several C-64 programs stand waiting to help.

CDA's Micro Wine Companion, now in its third edition, ties wine choices to food recipes from the company's cookbook disks (see below). It catalogs wines by 19 criteria, including price, approximate purchase date, type, country and flavor; provides wine-tasting reviews; and prints pocket reviews in 11 different formats for handy reference.

CHOW!

Concept Development also publishes a complete set of cookbooks on disk. The America Cooks series includes separate program packs covering such cuisines as Chinese, Italian, American, Mexican and French. Each package contains recipes from 20 to 24 top chefs representing each nationality, plus wine suggestions to complement the recipes.

CDA's Great Chefs program is a three-volume collection of more than 300 recipes from Public Broadcasting's television series by the same name. The program can alter recipes so that you can accommodate any number of guests, and it prints out lists of ingredients and instructions. You will find this a handy feature, since computers are seldom located in the food-preparation area.

These cookbook programs are versatile in searching through recipes by various parameters, such as name, main ingredient, whether the dish is served hot or cold and whether it's a main dish, side dish or dessert.

If you'd rather cook like a celebrity instead of a great chef, you'll be interested in The Celebrity Cookbook, from The Dream Machine. This program isn't as chock full of recipes as the others, but it still includes many offerings. It also provides a recipe filer and a quiz for determining if your weight problem is psychological, plus sections on nutrition, shopping manners and what food preferences reveal about personality. A bartender's guide provides instruction on making a dozen popular drinks, while a related program determines how much booze to buy for a big party.

COMPUTER TUTORS

Doing homework isn't fun, but Spinnaker Software's Homework Helper programs can make it easier. Homework Helper—Writing, for instance, breaks writing down into three stages: prewriting, writing and rewriting. It then applies these divisions to two types of assignments: book reports and essays. Book reports are further broken down into fiction, biography and informational, and essays into descriptive, narrative, persuasive and expository.

You specify the type of document you want to create; then the program automatically leads you through its preparation. For a book report, it begins by asking you the theme of the book, and even suggests universal themes to help. It also asks about the setting, characters and other particulars. Finally, you call up the built-in word processor to flesh out your answers into a completed report.

For persuasive essays, the program wants supporting arguments, as well as arguments that might be used by the opposition. It's a tedious process—but that's what writing is all about.

Spinnaker's Math Word Problems presents word problems, then shows you how to determine what's being asked and how to come up with an equation to solve the problem.

JUST YOUR TYPE

Of course, you might want to write letters to your friends about how you've slimmed down, hit the video-poker jackpot and learned to cook gourmet dishes, but maybe your typing's terrible. Well, several C-64 programs stand waiting to help.

Typing Tutor IV, from Simon & Schuster Software, is an upgrade of Typing Tutor III, a program that's sold 300,000 copies in three years. The new version asks how you type now (hunt-and-peck? two-finger? touch?) and how many hours a week you have for practicing, then tailors your lessons accordingly. It also distinguishes between upper- and lowercase letters and, recognizing that many people now use word processors instead of typewriters, lets you backspace to delete errors, even at a sacrifice of speed. Typing Tutor IV's Instructor mode can hold records for eight students, review their progress, add new tests, delete records and give multiple-level speed tests, and its Letter Invaders game spices up practice with arcade-type action.

MasterType, developed by The Scarborough System and distributed by Mindscape, displays fingers resting at the home position on the keyboard, then wiggling to show how to move to the upper and lower rows of the keyboard and back. ►

Table 1. Distributors and prices.

Applications Plus
15720 Harmony Way
Apple Valley, MN 55124
612-432-5560
Vegas Video Poker—$29.95

Baudville
1001 Medical Park Drive SE
Grand Rapids, MI 49506
616-957-3036
Guitar Wizard—$24.95

Robert Bowden
4907 22nd Ave. W
Bradenton, FL 34209
813-792-4876
Exercise Tracker—$15
For Ectomorphs Only—$10
Planning Tanning—$10
Vitamin Advisor—$10

Concept Development Associates
45 Cordova St.
St. Augustine, FL 32084
904-825-0220
America Cooks series—$14.95 each
Great Chefs—$65
Micro Wine Companion—$49.95
Mr. Boston's Official Micro Bartender's Guide—full version, $29.95; abridged version, $14.95

DJ Software
10636 Main St., Suite 414
Bellevue, WA 98004
206-883-9257
Easy Guitar—$30

The Dream Machine
Merrill Ward & Associates
255 N. El Cielo Rd., Suite 222
Palm Springs, CA 92262
619-320-5828
The Celebrity Cookbook—$29.99

Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
415-571-7171
Mavis Beacon Teaches Typing—$39.95

Enlightenment, Inc.
1240 Sanchez St.
San Francisco, CA 94114
415-641-9131
Jeremy Silman's Guide to Chess Openings—$59.95
Paul Whitehead Teaches Chess—$59.95

Nolo Press
950 Parker St.
Berkeley, CA 94710
415-549-1976
WillWriter—$39.95

Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
312-480-7667
Keys to Responsible Driving—$89.95
MasterType—$39.95
The Original Boston Computer Diet—$49.95
The Perfect Score (including *The Perfect College*)—$69.95; *The Perfect College* alone—$19.95

Progressive Peripherals & Software
464 Kalamath St.
Denver, CO 80204
303-825-4144
MicroLawyer—$59.95

PUMA U.S.A.
492 Old Connecticut Path
Framingham, MA 01701
617-875-0660
RS-Computer Shoe—$199.95 per pair

RUN Magazine
80 Elm St.
Peterborough, NH 03458
800-258-5473
RUN Calc (in ReRUN Productivity Pak III)—$19.97

Simon & Schuster Software
Gulf & Western Building
One Gulf + Western Plaza
New York, NY 10023
212-373-8882
Typing Tutor IV—$39.95

Spinnaker Software
One Kendall Square
Cambridge, MA 02139
617-494-1200
Homework Helper—Writing—$32.95
Math Word Problems—$32.95
Hayden Score Improvement System for the SAT—$39.95

Timeworks
444 Lake Cook Rd.
Deerfield, IL 60015
312-948-9200
Evelyn Wood Dynamic Reader—$29.95

> *Your C-64 may not be a lawyer, but there are programs for it that offer competent legal assistance.*

There are 18 lessons, each concentrating on a different section of the keyboard.

New on the scene is Mavis Beacon Teaches Typing, manufactured by Software Toolworks and distributed by Electronic Arts. If you're an adult, you'll practice on passages from Mavis's library of 1000 historical writings, while youngsters get to type jokes, riddles and rhymes. Mavis "speaks" in conversational tones while analyzing your typing mistakes. The program also displays a keyboard with fingers that type along with you to show correct fingering, and it lets you set a metronome to encourage even typing. To break the monotony, an Indy Racer game is included on the Mavis Beacon disk.

SAT: SOFTWARE ANTICIPATES TESTING

The letters SAT, for Scholastic Aptitude Test, often strike fear into the hearts of high school students. But now, as software anticipates testing, they signify help as well.

Among the programs students can turn to in preparing for this test is the Hayden Score Improvement System for the SAT, from Spinnaker. This extensive program fills seven disks and is divided into three sections: math, verbal and practice tests. The math section provides review in algebra, geometry, quantitative comparisons and word problems, while the verbal section covers vocabulary and reading comprehension. The practice tests include a diagnostic pretest for revealing the skills you need to work on, as well as two complete tests that are similar to the real thing, so you'll know what to expect on exam day.

Mindscape's Perfect Score preparation program for the SAT occupies six double-sided disks. The 149-page manual, which comes in a three-ring binder, provides detailed test-question examples. The package includes a separate program, the Perfect College database, which lists 1600 colleges and universities and lets you search for institutions according to criteria such as location, academic emphasis and cost.

DON'T MOVE YOUR LIPS!

If you need to improve your reading comprehension and speed, Timeworks' time-tested Evelyn Wood Dynamic Reader promises help. It flashes sentences and phrases on the screen and tells you how long you have to read them. There's no cheating and no looking back. Your progress is recorded on disk for review later in an easy-to-comprehend bar chart.

YOUR COMPUTER AS COUNSEL

When a person begins a sentence with, "Now, I'm not a lawyer, but. . .," watch out! However, if it's a Commodore speaking, you might well listen. Your C-64 may not be a lawyer, but there are programs for it that offer competent legal assistance.

For instance, WillWriter from the Nolo Press is designed to produce a valid will. The book accompanying the program says many people resist making or updating their will "to avoid high lawyer fees." However, if you need only a simple will, you may be able to prepare it for only the price of this program. Several estate attorneys who have looked at WillWriter said it is suitable for people who have uncomplicated estates and no business ventures.

WillWriter's book helps you determine if a simple will can meet your needs. If so, you go on to the program, which produces a thorough document, including gifts to children and others.

Progressive Peripherals' MicroLawyer produces blanks of more than 100 commonly used legal forms, to be used, as the program states, "in conjunction with advice from your lawyer."

Why bother with the program if you need a lawyer anyway? Because, in the process of filling out the forms, you'll gather needed information and focus your direction, thereby reducing the number of hours for which you'll have to pay your attorney.

THERE'S MORE

From cookstove to courthouse, C-64 software can help you do things faster and more proficiently. This article is only a sampling of available programs, so look around and read *RUN*'s software reviews and advertisements. Without appropriate software, your Commodore doesn't live up to its full potential, and maybe you aren't living up to yours, either. ■

Lonnie Brown is an editorial writer and computer columnist for a New York Times-owned newspaper in central Florida.

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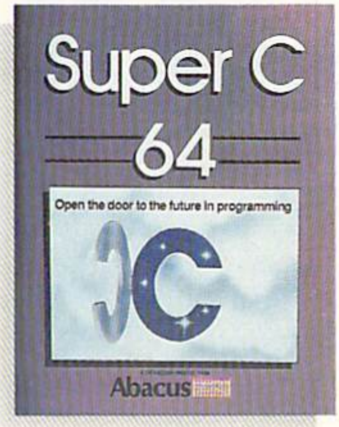
Super C 64
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C
Abacus

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C-64 $59.95 C-128 $59.95

Cadpak—The professional design tool. Enter simple or intricate drawings with the keyboard, lightpen or 1531 mouse. With the flexible object editor you can create libraries of furniture, electronics, etc. as intricate as screen resolution permits. Zoom in to do detailed work. Produce exact scaled output to most printers in inches, feet, etc. Get design results fast with **Cadpak** and your Commodore® computer.
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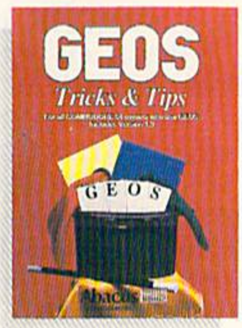
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RUN TERM 128

By TOM BROWN

RUN TERM 128 IS A POWERFUL TELECOMMUNICATIONS PROGRAM OFFERING FEATURES THAT RIVAL THOSE OF COMMERCIAL PROGRAMS. IT SUPPORTS BOTH 40- AND 80-COLUMN MODE; 300 AND 1200 BAUD; BOTH THE PUNTER AND XMODEM FILE-TRANSFER PROTOCOLS; A NINE-NUMBER PHONE BOOK; AN AUTODIALER THAT WORKS WITH THE COMMODORE 1650, 1660 AND 1670, AND WITH THE HAYES MODEMS; A 60K TEXT BUFFER; AND MORE!

RUN TERM 128 IS COMPOSED OF FIVE DISK FILES. USING *RUN*'S NEW CHECKSUM PROGRAM ON PAGE 80 OF THIS ISSUE, TYPE IN EACH FILE CAREFULLY AND SAVE IT TO A FRESHLY FORMATTED BLANK DISK. THE LISTINGS APPEAR IN A SPECIAL FORM, CONSISTING OF HEXADECIMAL DATA AND A SMALL BASIC HEADER THAT READS IN THE HEX DATA, CONVERTS IT TO INDIVIDUAL BYTES, AND THEN ACTUALLY CREATES A BINARY FILE ON YOUR DISK.

ONCE YOU'VE SAVED ALL FIVE FILES TO DISK, RUN THE FOUR HEX LISTINGS TO CREATE THE ACTUAL PROGRAM FILES. THEN LOAD AND RUN THE BASIC PROGRAM CALLED BOOT.RUNTERM128. WHEN THE PROGRAM HAS BEEN ACTIVATED, THE SCREEN FLICKERS MOMENTARILY AND PROMPTS FOR THE TIME APPEAR. PRESSING THE RETURN KEY AT THE FIRST PROMPT (AM/PM) ZEROES THE CLOCK AND EXITS TO TERMINAL MODE. ►

RUN it right: **C-128; modem**

ILLUSTRATION BY ROWENA SMITH

At this point, the Status line (see below) appears at the top of the screen, accompanied by a brief help menu listing the main program commands. You can also bring up this menu by pressing the help key from Terminal mode.

Whenever the Status line (marked by the clock on the right side) appears on the screen, you're in Terminal mode, and the main ALT commands (see below) are active. When you select a program option, the Status line disappears and these commands are no longer available. Normally, this is because you're being asked for a menu selection, filename or other input.

When you return to Terminal mode, the screen is usually the same as you left it, except in Conference mode and during file transfers. Some ALT commands don't change the screen at any time during execution.

THE STATUS LINE

The top line of the screen is called the Status line and displays information on the program's internal settings. On the right end of the line is the clock. If your modem can detect a carrier, you'll see a lowercase c to the left of the time whenever a carrier is present. On the left end of the line is the baud rate—either 300 or 1200. To the right of the baud rate is a set of single-letter flags: b e w j t d s. Their meanings are as follows:

b—the text buffer is open to receive characters from the modem for later retrieval.

e—the Echo function is on. Sometimes called half-duplex, Echo displays what you've typed, if the service you're on doesn't echo characters back to your computer.

w—the Buffer Wrap function is on. When the text buffer fills up, buffer wrap makes it wrap around to continue to accept data. Otherwise, the buffer closes when it's full.

j—linefeeds from the modem will be printed to the screen. When this option isn't on, linefeeds are ignored. This feature works by changing the Input Translation table.

t—ASCII translation during Xmodem file transfers is activated.

d—DLE screening (used for PC Pursuit) during Xmodem file transfers is on.

s—padding will be stripped from the end of files downloaded using any Xmodem option. If an s isn't present, such padding is retained.

When any of the above letters don't appear in the Status line, those options are not in use.

THE TRANSLATION TABLE

All the keys behave in their default state, as they do in the VT100 program on the 1670 demo disk, and RUN Term 128 uses the same translation tables as VT100. However, RUN Term 128 isn't specifically designed for VT100 emulation, so some substitute keypresses are needed. I've used the ones that follow, with the Commodore substitute listed first.

Shifted + equals {
Shifted – (minus) equals }
Commodore/– equals |
Shifted ↑ equals ~
↑ equals ^
£ equals \
Shifted @ equals

Note that escape sequences aren't supported by RUN Term 128, so the program may not operate properly on remote full-screen editors.

THE ALT COMMANDS

To view most of RUN Term 128's available commands, press the help key. Execute these commands by holding down the ALT key at the top of the keyboard as you press the desired command key. The following are the ALT key commands available in RUN Term 128:

A—Accesses Autodial mode. First you must specify your modem type, then the number of seconds you want to elapse between dial attempts. Finally, you can enter a number directly or use the Phonebook.

The Phonebook commands are a straightforward Load, Save and Edit. If you choose to Edit with nothing in memory, a new blank book is created for you.

You can enter nine numbers in a Phonebook. Each entry includes the name of the BBS, its phone number and three strings, which can be used to send a log-on sequence. If you're using the 1670/Hayes option, the first character of every phone number must be a letter p or t (note the lowercase) to indicate pulse or tone dialing. With the 1650 or 1660 dialing option, an asterisk in the phone number delays dialing for one second.

B—Toggles the Text Buffer open and closed. To find out where you are in the buffer, press the help key. Below the list of commands you'll see the present position of the buffer write pointer, with the maximum possible value of the pointer in parentheses.

C—Selects Conference mode, which makes a number of simultaneous connections possible. At the top of the screen, you'll see a row of 80 reverse-video spaces, where your characters appear as you type. There's no cursor in this mode. Press control/X to erase the whole line, or use the delete key to erase individual characters as usual. Your line of text won't be sent until you press the return key. Characters received from the modem are printed at the bottom of the screen. It's recommended that you instruct the on-line service *not* to echo your characters back while you're using this option.

The *only* way to exit Conference mode is with the stop key, because none of the ALT command keys are available. However, settings such as Buffer Open/Close, Echo and Baud Rate that are selected in regular Terminal mode are active in Conference mode. In other words, open the buffer *before* entering Conference mode!

D—Downloads (receives) a file from another computer. This option works only with drive 8. You have a choice of Punter protocol or one of three Xmodem protocols: Checksum, CRC or WXmodem.

Don't worry if you don't know which Xmodem protocol to use. Checksum is the standard, and the program automatically switches from WXmodem to CRC and from CRC to Checksum, if it doesn't connect properly using the protocol you selected.

WXmodem, which stands for Windowed Xmodem, is relatively new to Commodore users. Available only on PeopleLink (PLink), it transfers four Xmodem blocks at a time, so it's faster than Checksum or CRC.

To abort Punter transfers, hold down the Commodore key. To abort Xmodem transfers, hold down the stop key.

Punter indicates a block has transferred correctly by printing a hyphen to the screen or incorrectly by printing a colon. Xmodem clearly lists the number of blocks and the number of errors in the transfer as ASCII digits.

During any Xmodem transfer (up- or download), the file is visible on the 40-column screen as it moves. If you're in 80-column and want to view a file as it passes through, you can switch to 40 columns by using the composite/RGB switch on your monitor.

Since Xmodem files must be transmitted in blocks of 128 bytes, you may have to add bytes to the last block to give it the full 128. This is called file padding and is done using either control/Zs or CHR$(0)s (zero bytes).

The Xmodem standard requires the transmitting program to make sure the byte used for padding is *different from* the last byte of the file. A few Xmodem programs (including *RUN*'s RUNning Board BBS) fail to do this, so downloads from them using the Pad Stripping option may be garbled. To remedy this, turn off the Pad Stripping option by using the appropriate option from the Default submenu (see * below).

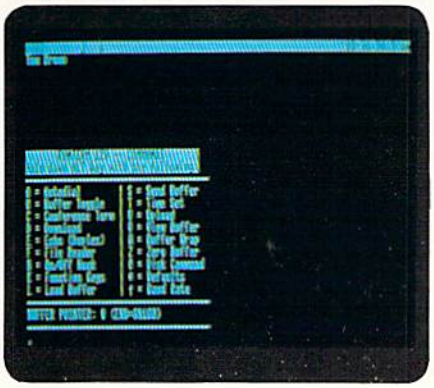
E—Toggles the Echo mode—sometimes referred to as *half-duplex*—on and off. When Echo mode is off, you're in *full-duplex*. If you can't see what you're typing when you're online, turn on Echo mode.

F—Sequential file reader. Use this command to send a file to the screen, printer or modem. See Boot.RUNTerm128 (Listing 1) for the printer device and secondary address number Pokes, which default to device 4 and secondary address 7. A file is translated to ASCII when sent to the modem.

H—A modem, like a phone, can be "off the hook" or "on the hook." This option works only with the 1650 and 1660 modems, and it's a toggle, because the pick-up command for the 1650 is the hang-up command for the 1660.

To hang up the 1670 and other Hayes-compatible modems, press the plus-sign key three times in rapid succession from Terminal mode, with a pause both before and after the trio of keypresses. The pause tells the modem you're sending a command, not just sending a line of plus signs to the remote terminal or BBS.

To pick up a 1670/Hayes modem, type in an uppercase ATD to access Originate mode (like dialing without a phone number) or an all-caps ATA to force your modem into Autodial mode.



Main menu for RUN Term 128, showing the options.

J—Toggles linefeed printing. This option actually changes the Input Translation table. Some services always send CHR$(10) (a linefeed) with each return, leaving you with double-spaced text. It's usually best to turn linefeeds off, unless you need them.

K—RUN Term 128 redefines only the help key and the shifted run-stop key, but, using Basic 7.0 commands in Direct mode, you can define a set of function keys for your own special use while online. This option lets you load and save these keys easily.

L—Loads a sequential file into the text buffer, starting at the buffer write-pointer position. When the load is finished, the write-pointer is updated, allowing you to append several other sequential files. To force the load into the start of the buffer, first zero the buffer (see Z below).

When you return to the Terminal mode, remember that the screen is preserved during operations such as loading the buffer. If you had the main menu on the screen before the buffer load, you'll find the buffer write-pointer unchanged when you return to Terminal mode.

Press the help key again if you want to see the updated buffer write-pointer.

S—Saves your choice of the entire buffer area (60K) or the area from the start of the buffer to the buffer write-pointer. The first of these options is handy for use with the Buffer Wrap feature and the second for saving short pieces of data. The save is directed to your choice of three devices: to disk, as a standard sequential file; to the printer (see F above); or to the modem (with ASCII translation).

T—Sets the on-screen clock. By pressing return at the AM/PM prompt, you can instantly zero the clock.

U—Uploads (sends) a file via Punter or one of two Xmodem protocols: Checksum or CRC. Due to hardware limitations in the C-128, WXmodem (see D above) isn't available for uploading files.

V—View the text buffer. Text is formatted on the screen, with a left arrow taking the place of a return. The following key commands are active in this option:

Cursor down: Scrolls the buffer forward (advances through the text).

Cursor up: Scrolls the buffer backward (toward the beginning of the text).

Plus sign: Scrolls forward 256 characters.

Minus sign: Scrolls backward 256 characters.

Home: Moves to the start of the buffer. Any other keypress exits to Terminal mode.

W—Toggles the Buffer Wrap function. Sometimes it's inconvenient to have a buffer close in the middle of a transmission. This option forces the buffer write-pointer back to the start of the buffer to continue writing, without the buffer closing. Note that the Buffer Wrap option works only when you're saving the entire 60K buffer (see S above). If this option is turned off, the buffer closes when it's full.

Z—Zeroes the buffer and fills the entire buffer with CHR$(13)s (returns). When you press Z, the Terminal mode screen doesn't change, but the cursor vanishes, then reappears shortly.

@—Sends a disk command. When you're prompted for a command string, input is a dollar sign to Read the Directory. Pattern matching is possible here, as in the C-128's machine language monitor.

To read the disk drive's error channel, just press return without entering a command string.

Disk commands should be sent the same way as with the DOS Wedge, except you can omit the @ as the first character.

*****—Changes several system defaults. Select the proper menu options here to change the foreground and background colors; Punter protocol block size; and parity, stop bit, word length and delete key values.

Don't change the above parameters unless you know what you're doing! Also, changing the delete key value alters the Input and Output Translation tables. RUN Term 128's delete key value is CHR$(20), while some computers you call may use CHR$(127) or CHR$(8).

You can also opt for three Xmodem features here. One is ASCII translation, which makes text files more readable if they were written on another computer using true ASCII.

The second is DLE screening. Long-distance services, such as PC Pursuit, use the same Xmodem commands for their own operation as you use for file transfers. If the other computer has DLE screening available, then turn this option on.

The third Xmodem option is to strip file padding at the end of Xmodem downloads. The default is on (indicated by a letter s on the Status line). Turn this option off, and any bytes added to the end of the file during the transfer to your computer are left intact. Some programs won't work unless the extra padding is removed.

↑—Toggles between 300 and 1200 baud. Don't select 1200 baud unless you have a 1200-baud modem! Also, don't change baud rates while online. Modems that support 1200 baud, such as the 1670, set their own baud rate when you type in the ATD command to dial, and they can't change that setting until you hang up.

1, 2, 3—Holding down the ALT key with number key 1, 2 or 3 sends one of the three Phonebook strings to the modem, with translation to ASCII. Note that you must have dialed with the Phonebook option and that the selected Phonebook must still be in memory, so don't load another while you're still online. These three keys are deliberately sent slowly, due to problems I've experienced at 1200 baud with some online computer services.

Escape—Pressing the escape key while holding down the ALT key returns you to Basic. Don't press run-stop/restore! To reactivate RUN Term 128, type in the following in Direct mode and press return:

```
BANK0:SYS22000
```

ACKNOWLEDGMENTS

My thanks go to Kermit Woodall of PeopleLink (PLink) for not only turning my CRC Checksum routine into CRC Xmodem, but for going one step further and creating WXmodem, a protocol that was "physically impossible" for computers without a UART (Universal Asynchronous Receiver/Transmitter) chip! He has placed his work in the public domain, and for that we should *all* thank him. Ⓡ

Tom Brown has been writing programs for Commodore computers since 1983. His Prototerm for the C-64 has been a public domain staple for BBSs.

Continued on p. 88.

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Circle 68 on Reader Service card.

Sprinter Printer

Hitch Okidata's 180 to your Commodore and watch it gallop.

◇

By TIM WALSH

After reading several Okidata 180 press releases that passed through the office, I couldn't wait to get one of these printers. After all, it isn't every day that a manufacturer announces a 180-character-per-second printer that's Commodore compatible right out of the carton.

A speed of 180 cps is usually associated with expensive 24-pin, high-end printers, not low-cost machines aimed at the home market. Faster speed does not necessarily result in a better printer, though. Even the most conscientious manufacturers might sacrifice some reliability and software compatibility in the name of faster speed. Ideally, if the printer offers fast printing, it should complement the increase in speed with heavy-duty construction, software friendliness, and, above all, a price tag that doesn't outweigh that of your entire computer system. I'll let you be the judge as to whether or not the Okidata 180 meets or exceeds those desirable attributes.

DELIVERY DAY

When the 180 arrived, I was pleased to find a printer that had the same high quality of appearance found in other Okidata printers, such as the 182 and the Commodore-compatible 120. One look, and Okidata 180 buyers will know that their money wasn't wasted on flimsy, low-budget hardware.

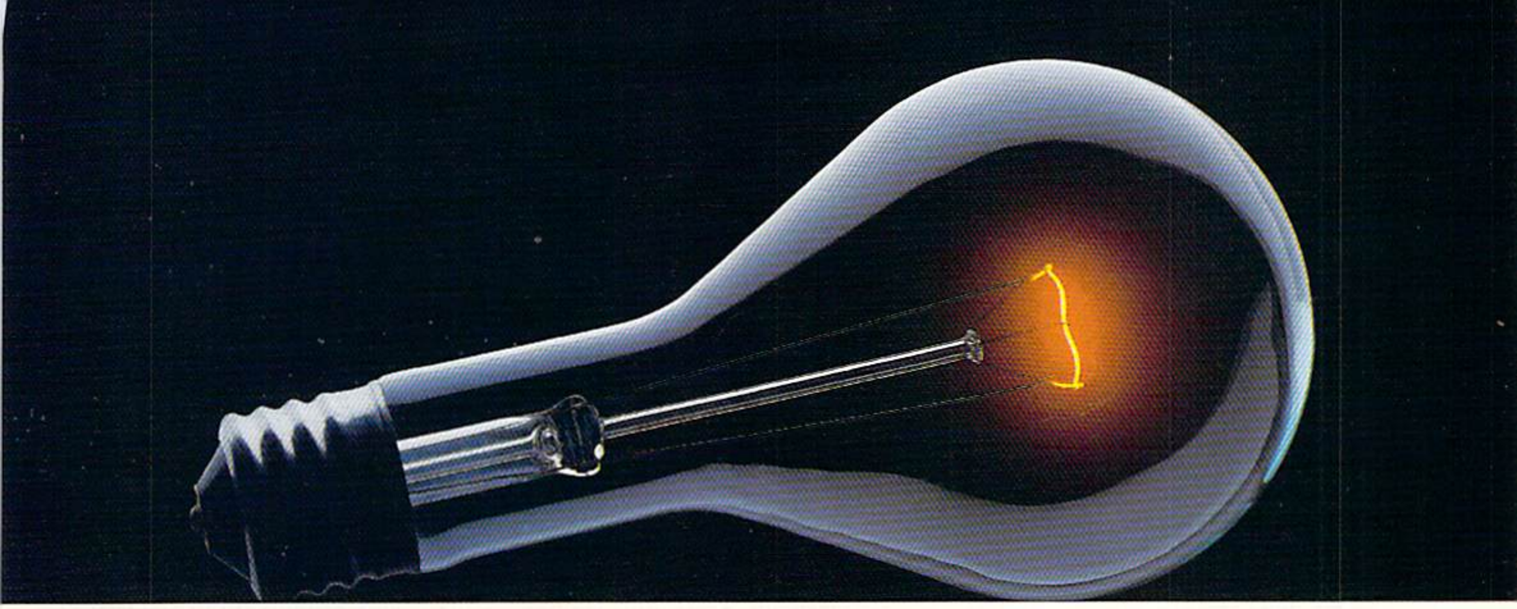
As the press releases promised, two cables were packaged with the unit, one designed for use with the printer's Commodore-compatible serial port and the other for interfacing the printer's parallel port with parallel computer systems. Remove the styrofoam packing materials, plug the serial cable into your disk drive, pop the nylon ribbon cartridge (replacement cost: $8.95) in place, and you're ready to print.

The Okidata 180, shown with accompanying serial and parallel cables.

With dimensions of 14.2 × 10.8 × 3.2 inches, the 180's size is roughly in the same ballpark as many other printers of its class. Four control buttons and a total of nine small LED-type lights are located on the front panel. The leftmost feed button lets you perform a printer self-test. It also controls line-feeds and, if held down for a second or two, form-feeds. Next to that button is the select button, which lets you perform hex dumps and toggle the printer on- and off-line.

Moving to the other side of the control panel, the rightmost button lets you choose from three print modes: Near Letter Quality, Utility (draft) and HSD (High-Speed Draft). Finally, the button to the left of the print-mode button permits the selection of 10-, 12- or 17.1-character-per-inch print pitch.

Other print controls include a bank of dual in-line package (DIP) switches hidden under a cover in the rear of the unit. Once you find a screwdriver to remove the cover, you'll be able to use the DIP switches to select Commodore or Epson printer emulation, set both form lengths and automatic linefeeds, ►



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Circle 64 on Reader Service card.

choose international character sets, adjust graphics density and assign the unit a printer device number of 4 or 5.

One feature I found useful was a folding paper separator located on top of the unit. It locks into an upright position for single sheets and folds flat for continuous forms. Rather than try to incorporate a fancy, complicated design, Okidata opted for simplicity, and the result is an effective, easily manipulated paper separator. Incidentally, the 180 also has an opening underneath for an alternative method of printing continuous forms.

Like other Okidata printers, tractor-feed sprockets are built into both ends of the platen roller, which means that they cannot be adjusted. This raises the question of how you print continuous mailing labels with this printer. You won't find any clues in the manual, but having gained experience with a few Okidata printers of similar design, I've developed a sure-fire solution. Lower the paper separator, then align the holes on the left side of the labels with the left sprocket teeth and set the paper lever to friction feed. Aligning your addresses horizontally is simply a matter of using your label program to set the left margin; or you can choose to set the printer's left margin to a default value that works best with your labels.

DOCUMENTATION

An 88-page, clearly written reference guide takes you on an informative printer tour and provides about as much information as most users probably need in order to use the 180 with their computer systems. Okidata devotes eleven pages of the manual to instructions on using the printer with commercial software. Half of those pages are devoted to three Commodore word processors: PaperClip, Easy Script and WordPro.

For the most part, the instructions explain how to access some of the Okidata 180's various print options from those software packages. For instance, you'll find the control-code format for underlining with PaperClip, getting subscripts within Easy Script and assigning decimal codes in WordPro. None of the instructions go into great detail, but they're substantial enough to get you started.

COMPATIBILITY CAMPAIGN

Exhaustive testing revealed that the printer works with a variety of Commodore-specific graphics packages. I subjected it to the equivalent of the acid test. Connected to my C-128D, it was barraged for weeks with endless work—screen dumps of graphics, commercial printing packages, manuscripts, program listings—you name it, I tried it.

30 PRINT
40 GO T

I found the print quality in Near Letter Quality mode as good as or better than most printers in the 180's price range, but not quite as crisp as the Commodore-compatible Star NL-10, the printer whose NLQ mode serves as a bench mark by which all other low-cost printers should be measured. Overall, though, the NLQ mode is probably impressive enough to attract many buyers. NLQ is available in both 10- and 12-pitch print modes.

Draft and High-Speed Draft modes are both clear and are easier to read than Draft modes on most other printers. Not only is the quality and readability exceptionally good, but it is very easy to change modes. Simply press a button to select the off-line mode of the printer, then toggle through NLQ, Draft and High-Speed Draft. Of course, if you opt for software control, the manual does list the printer-control codes used to access those options.

As mentioned previously, the 180 supplies an Epson mode that opens up a great deal of flexibility, especially for those who need the features the Epson mode offers. For starters, it gives you 9-pin graphics and a choice of eight graphic densities, ranging from a single density of 60 dots per inch, up to a high of 240 dots per inch in quadruple-density graphics.

Like all Epson-compatible printers, accessing these graphics in your own programs requires some effort on the part of the user, and the manual gives the same advice I do—purchase a software program that lets you enter the codes needed to access those graphics. Getting such software is no problem, since nearly every commercial software package for the C-64 and C-128 provides Epson printer drivers.

The 41 Commodore and 58 Epson control codes that the manual clearly lists in both decimal and hexadecimal configurations make programming the 180 through software fairly easy. Every print option, from selecting print pitch to setting tabs, is given, but no mention is made of which features can be mixed together. For instance, NLQ isn't available in 17.1 cpi mode, so entering that combination of control codes is ineffective.

With the printer in Commodore mode, you have a choice of 10, 12 or 17.1 cpi printing. In Epson mode, a fourth print pitch of 20 cpi is offered, which allows printing up to 160 characters per line. Other print options available include sub- and superscripts, enhanced, emphasized, double-width and underline printing, in both Commodore and Epson modes. Like most Epson emulation modes, it also offers an italicized character set.

When using the 180 with graphics printing packages, I expected it to work well, and it did. In Commodore mode, with software using printer drivers such as 1525, MPS-1000, MPS-1200, and so on, the printer works very well. Print Shop, Newsroom and Printmaster graphics all print without a hitch and look great on the 180.

In an effort to discover the printer's performance using the parallel connector, I performed testing on an Amiga 500 and was alarmed to discover the printer didn't work in Parallel mode. Further investigation revealed that the 180 was innocent of any wrongdoing—the printer port on the Amiga was defective.

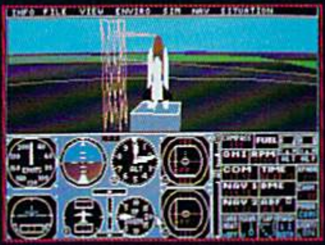
CONCLUSION

Overall, the 180 is a fine printer. New owners certainly won't be disappointed with it. It looks good, operates quietly and quickly and offers a compatibility option that doesn't limit your use to the C-64 and C-128. I'd have a hard time deciding between purchasing the 180 and quite a few other top-notch competing printers, such as the Commodore MPS-1200 and 1250, the Star Micronics NL-10 and NX-10 and a half-dozen or so parallel printers.

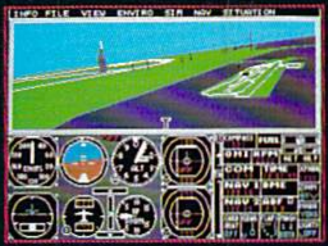
The mere fact that the advent of the 180 makes the purchasing decision so difficult says a lot for the printer. If it had any significant shortcomings, the decision would be easy. *(Okidata, 532 Fellowship Rd., Mt. Laurel, NJ 08054. $329.)* ■

Tim Walsh, RUN*'s technical editor, is our indefatigable resident hardware tester and reviewer.*

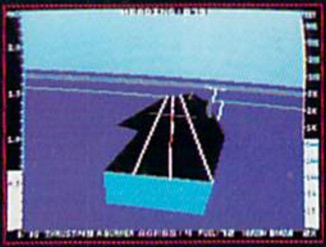
Circle 26 on Reader Service card.



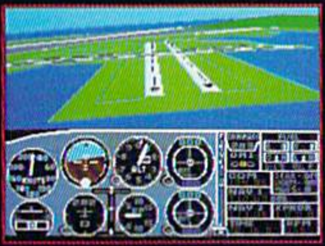
1987 - Expanding Scenery disk coverage; East Coast, Japan, & Europe



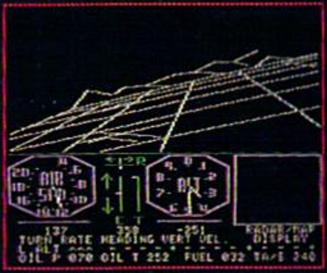
1986 - Flight Simulator II for the 68000 computers



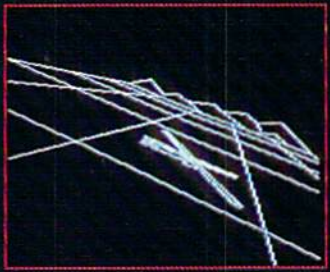
1985 - High-performance Jet flight simulator for the IBM, Commodore 64, and Apple II computers



1982/1983 - Microsoft Flight Simulator & Flight Simulator II



1979 - 3D graphics applied to the original FS1 Flight Simulator for the new Apple II and TRS-80 computers



1977 - SubLOGIC's 3D graphics package in BASIC and M6800 Assembly Language

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We invite you to help us celebrate our first decade of success, and share in our anticipation of the next ten years to come. SubLOGIC tenth-anniversary promotional shirts and posters are available at your dealer or directly from SubLOGIC. See your dealer, or write or call us for more information.

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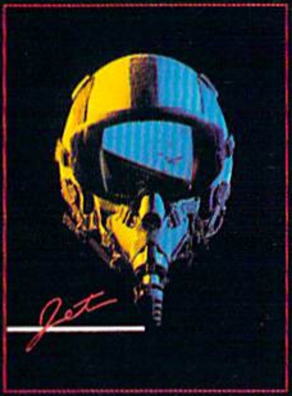


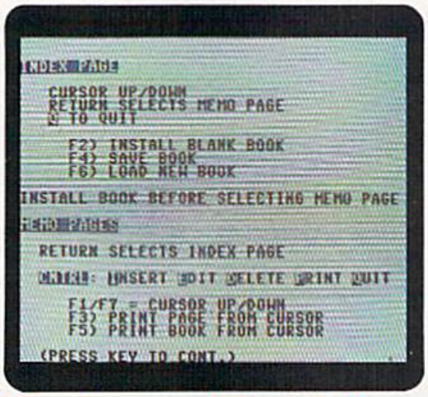
RUN's Memo Book

Now your frequently used names and addresses are available at the press of a key.

◆

By BARBARA MINTZ

If you'd like to set up a simple, versatile file system with a minimum of effort and a maximum of flexibility, then it's time to add *RUN*'s Memo Book to your collection of C-64 application programs. Memo Book is an electronic "Rolodex" you can organize and format any way you want, then flip through the pages at will. And "flip" it is, for the machine language program is fast, and your data is held in memory, so no time is lost in disk access.



```
INDEX PAGE

  CURSOR UP/DOWN
  RETURN SELECTS MEMO PAGE
  Q TO QUIT

    F2) INSTALL BLANK BOOK
    F4) SAVE BOOK
    F6) LOAD NEW BOOK

INSTALL BOOK BEFORE SELECTING MEMO PAGE

MEMO PAGES

 RETURN SELECTS INDEX PAGE

 CNTRL: INSERT EDIT DELETE PRINT QUIT

    F1/F7 = CURSOR UP/DOWN
    F3) PRINT PAGE FROM CURSOR
    F5) PRINT BOOK FROM CURSOR

 (PRESS KEY TO CONT.)
```

Menu of commands from the Memo Book program.

GETTING STARTED

Type in Listing 1 using *RUN*'s Checksum, and save it to disk. Once it has been saved, run it and Memo Book installs itself at the top of Basic memory, starting at address $9400. Then it resets the top-of-Basic pointers to that address, so Basic programs won't interfere with Memo Book's operation. About 141 blocks are left free for a second program. Memo Book also inserts the address of its own machine code in Basic's error vector at $300, to intercept the routine that prints Basic's error messages. This makes Memo Book's index page, instead of the usual Syntax Error message, appear each time you press * and return.

When initialization is complete, a subroutine clears the Basic program area, resets all the pointers and displays Memo Book's index page. You can go on to set up your Memo Book at this point, or, if it's already set up, you can leave the program by pressing Q and return, and load another program. Unless the program you load is unusually long or changes the Basic pointers (which many commercial programs do), you can continue to read and write memos until you turn off your computer.

If a crash forces a reset, you can probably reinitialize Memo Book with SYS 40486. Even if you can't, your entries should be safe, because they're stored out of the way under Basic's ROM. Nevertheless, when you've made a lot of entries, better safe than sorry—back up your data by saving it to disk.

When you use the program for the first time, you'll have to set up your memo book. To start this process, press F2. Then, at the question "Save This Book?", respond with N, since you don't yet have a book to save. Finally, press return, and the first empty page of your memo book will appear.

If you've already set up a book with data and saved it to disk, this is the time to load it into memory. Press F6 and, at the prompt, type the filename of the book and press return. When the index page appears, use the cursor keys to scroll to the page you want, then press return to display the page on the screen. You can also "flip" through the pages of your book by scrolling. Use the cursor keys to scroll rapidly, or F1 and F7 to scroll slowly. If the number of entries makes scrolling through the pages unwieldy, press return to go back to the index and pop to another page.

Memo Book has relatively few commands to remember, and I've kept those few as intuitive as possible. If you do need to refresh your memory, enter ? to see the Help screen. Also, if you ever issue the wrong command, you can abort it with a return. Commands that affect the entire book must be entered from the index page.

RUN it right: **C-64**

INPUTTING ENTRIES

The command for adding entries to your memo book is control/I (for insert). It works whenever the cursor points to an empty line, whether you're starting a new book or adding entries to one that's already established.

After you press control/I, the screen clears, and a red prompt message instructs you to input an entry. The entry can be up to six lines long and 38 columns wide, and you can format it any way you like, with whatever punctuation you find convenient. If one six-line entry isn't enough, continue right below with another. If you have trouble staying within the 38-column limit, the segmented guideline I've provided should help.

Press return at the end of each line, and signal completion of your entry by pressing return on an empty line. You'll find yourself back in the memo book, ►

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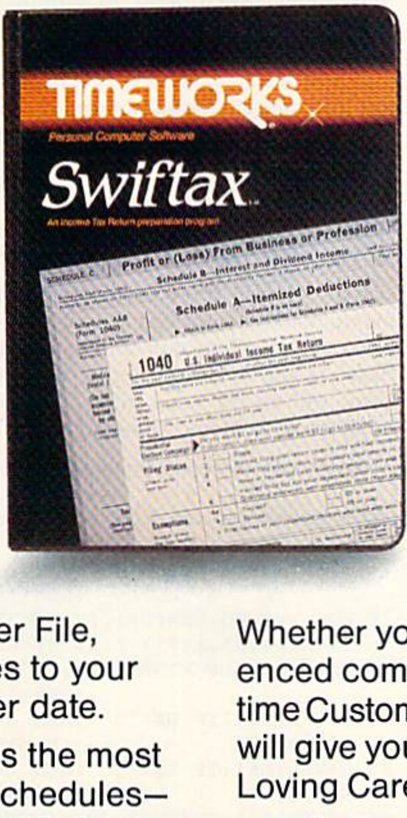
TIMEWORKS
Personal Computer Software
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An Income Tax Return preparation program
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Circle 168 on Reader Service card.

looking at the new entry. When you're adding a lot of new entries, it's wise to save your data frequently.

EDITING ENTRIES

To edit an entry, press control/E. Once again the screen will clear, but this time the entry you want to edit will appear, with a flashing cursor at its first character. Edit one line of the entry at a time, using all the normal keys to insert, delete and overwrite characters. When you finish a line, press return. In fact, you must press return for each line you want to retain, whether you change it or not. Conversely, if you want to eliminate a line, move the cursor to the next line without pressing return.

To insert a new line in an entry, move the cursor to an empty line, type in your data and press return. Then move the cursor back to edit the next line.

When you've finished editing your entry, press return on an empty line to put it back in the memo book.

DELETING ENTRIES

Control/D, as you might expect, deletes an entry. To prevent accidents, you must confirm by pressing Y that the entry, now highlighted in red, really should be deleted.

SAVING A BOOK

Press F4 to save a book. When the program asks if you want to update a file, a yes response will scratch the old file, and the book you're currently using will be saved in its place. As I've mentioned, F2 starts a completely new book. Here, also, you have the option of saving the current book first.

A full book occupies about 35 blocks in memory locations \$A000–\$C000. However, only the portion that actually contains data is saved and reloaded, so no time and disk space is wasted on empty bytes.

PRINTING

To print out one entry, press control/P, then, at the prompts, choose to print the entire entry, omit the last line or omit the last two lines. If you keep phone numbers and comments on those lines, you'll want to eliminate them when you print addresses on envelopes or labels.

If you want to print a full page of entries, press F3. Again, you can choose to eliminate lines, and the page will be printed beginning at the cursor position. F5 prints the entire book, with the same options.

RETURNING TO BASIC

When you're done consulting your memo book, if you're on a memo page, press control/Q to quit and return to Basic. If you're on the index page, Q alone will do the same thing. You can jump back to Memo Book from Basic at any time by pressing * and return in Direct mode.

MULTIPLE APPLICATIONS

Because it's so unstructured, Memo Book can be used for a variety of purposes simultaneously. It's easy, for example, to add appointments and a list of "things to do" to the top of the first page, under A. If you don't scroll the index, the book will automatically open there, for a quick check of your schedule.

It's equally easy to set up and use several books for different purposes, because Memo Book lets you save one book and load another by just returning to the index and inputting F6. Because the load will obliterate the data you've been working on, the program will ask if you want to save the present book before loading the next one. Responding Y gives you a save routine similar to the one I described earlier.

When that book has been taken care of, you'll be prompted for the name of the book you want to load, and the load will take place. It's a good idea to keep a list of your memo books somewhere in each book, so you don't have to consult the disk directory for the correct names. 🅁

Barbara Mintz is a director of the Boston Computer Society's Commodore user's group and director of software development for Brown Boxes, Inc.

Listing 1. Memo Book program. (Note: Checksums are for *RUN*'s new checksum program.)

```
0 REM BASIC HEX LOADER FOR RUN
  MEMO BOOK                :REM*184
5 OPEN 8,8,8,"RUN MEMO BOOK,P,W
  "                         :REM*64
10 READ A$:IF A$="-1" THEN CLOS
   E8:END                   :REM*78
15 IF LEN(A$)<62 THEN 55
                           :REM*254
20 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,20)      :REM*242
25 FOR I=1 TO 30           :REM*181
30 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                           :REM*209
35 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55                :REM*85
40 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55               :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                            :REM*67
50 NEXT:GOTO 10            :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
   O 70                    :REM*184
60 IF LEN(A$)<42 THEN B$=LEFT$(
   A$,20)+RIGHT$(A$,(LEN(A$)-21
   ):GOTO 70               :REM*137
65 B$=LEFT$(A$,20)+MID$(A$,22,2
   0)+RIGHT$(A$,LEN(A$)-42)
                           :REM*140
70 FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                           :REM*140
80 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55                :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55                :REM*84
90 BY=H*16+L:PRINT#8,CHR$(BY);
                           :REM*148
95 NEXT:GOTO 10            :REM*160
100 REM RUN MEMO BOOK FOR THE C
    64                     :REM*150
101 DATA 01080C0832009E323036 3
    83A0012083C0080000 00A9948
    5FCA90085FBA8          :REM*172
102 DATA A93985FDA90885FEB1FD 9
    1FBC8D0F9E6FEE6FCA5 FCC9A0D
    0EF4C269EA906          :REM*182
103 DATA 8D8602A9018D21D0A941 8
    5FBA94E85FCA2008E39 03A915A
    095201EABA218          :REM*148
104 DATA A0041820F0FFA942A095 2
    01EABA206A00B1820F0 FFA93E2
    0D2FFA5FBE6FB          :REM*247
105 DATA 20D2FFA01820F0FFA93E 2
    0D2FFA5FCE6FC20D2FF E8E013D
    0D818A20BA01C          :REM*187
106 DATA 20F0FFA935A095201EAB A
    2018E3A03A206A00B4C D39420E
    4FFF0FBC989F0          :REM*222
107 DATA 6EC98AF06DC98BF06CC9 1
    1F016C991F035C93FF0 63C90DD
    0034CFA94C951          :REM*177
108 DATA D0D84C7996EE3A03AE3A 0
    3206395E00EF00FE01B D0034C6
    69420D2FF206E          :REM*245
109 DATA 95D0B9A206A0184CD394 C
    E3A03206395AE3A03F0 12E00DD
    0E2A212A00B18          :REM*144
110 DATA 20F0FF206E954C7294A2 1
    A8E3A03A212A0184CD3 944CC89
    D4CDF9C4C629D           :REM*22
111 DATA A9008D35034C5A9E2094 9
    5ADFFBFCDFEBFD0034C 1396209
    B95A977A09520            :REM*0
112 DATA 1EAB4C4F97930D0D2020 2
    02020202020202020 1252554
    E204D454D4F20          :REM*251
113 DATA 424F4F4B0D0D0012203F 2
    03D2048454C50209200 28434F5
    0595249474854          :REM*137 ►
```

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Space Combat Simulation

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Operation Copernicus

Deep Space Comes Down To Earth

DATE: 3 JUNE 2123
FROM: COMMAND CENTER TERRA
TO: INTERCEPTOR COMMAND
CODE: EYES ONLY PRIORITY ONE

REPORTED HOSTILE ACTION AGAINST MANNED INSTALLATIONS CONFIRMED STOP
ALL VESSELS PROCEED SOONEST INHABITED SECTORS TROJAN GROUP STOP
EQUIP MAX WEAPONS LOAD STOP
SEEK AND DESTROY ALL UNIDENTIFIED MILITARY CRAFT STOP

THIS IS NOT REPEAT NOT A DRILL STOP
OPERATION CODE STATUS IS RED STOP
BEST LUCK STOP

Acceleration presses you deep into your cushioned seat. The ship's hull resonates to the throb of your fusion engines, creating a deep rumble almost below the range of hearing. Speed climbs swiftly. The rocks of the Asteroid Belt hurtle past your viewports.

Your apprehension grows....

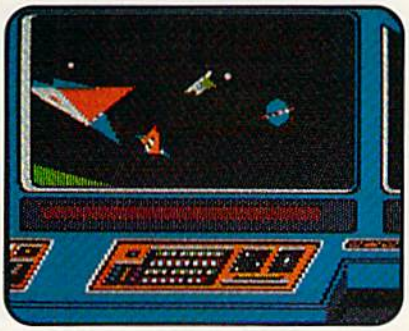
Until now, a scene like this could take place only in your imagination. If you wanted to picture what it would be like to fly — and fight — in deep space, you could only lean back, close your eyes, and dream.

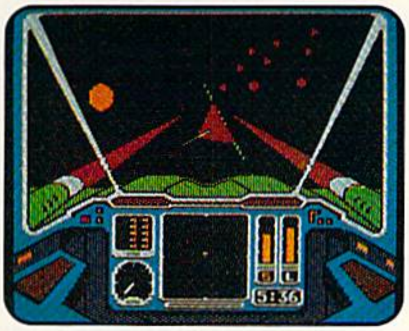
Until now.

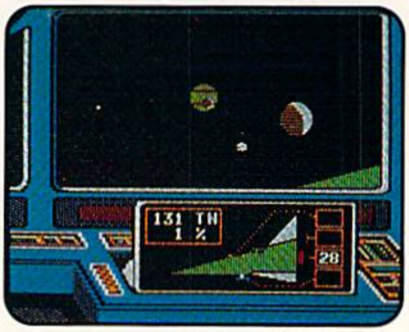
Now there is *Deep Space*. The space-combat simulator that puts you in the pilot's seat with advanced 3D graphics and realistic spaceship behavior, cunningly contrived to work on your down-to-earth personal computer.

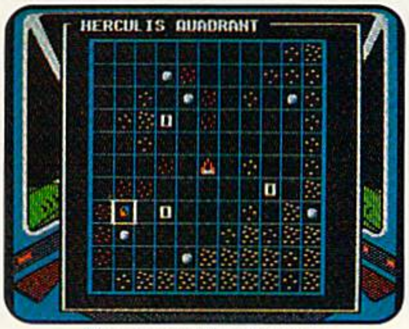
Choose from 3 levels of difficulty on each of 4 different missions, each in its own separately mapped sector of the Trojan asteroids. Will you be able to complete your mission and return to land safely on your base planetoid? There's only one way to find out.

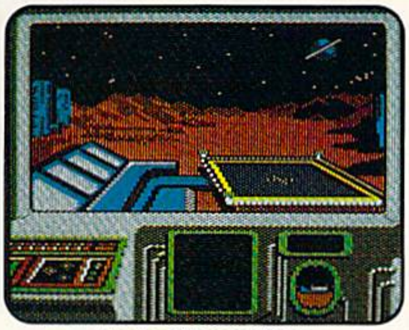
Deep Space. It's from Sir-Tech, so you know it performs.


Look-left Dashboard


Forward Dashboard


Look-right Dashboard


Quadrant Map Display


Control Tower View

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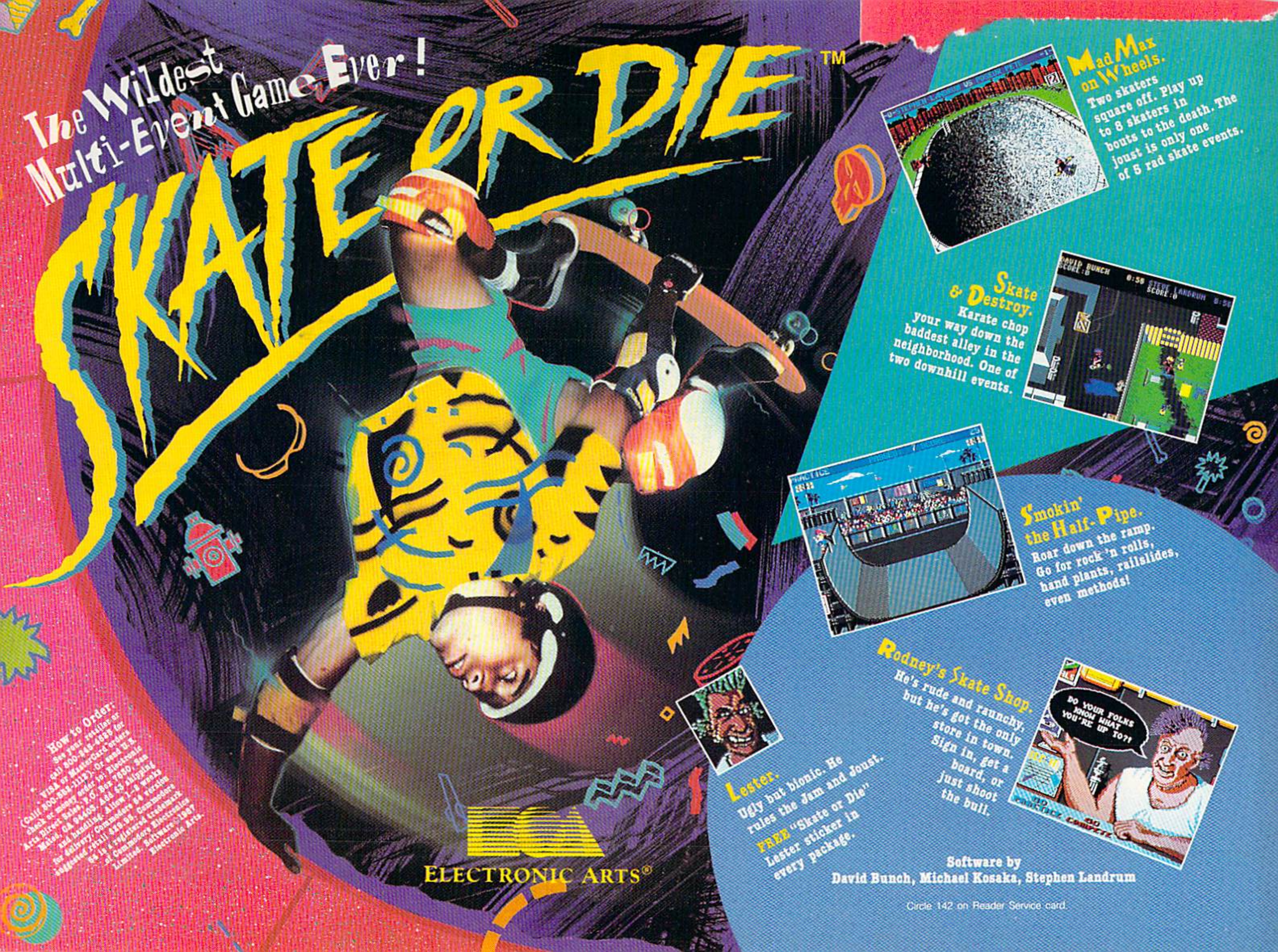
```
114 DATA 2042524F574E20424F58 4
    5532C494E4320313938 3729004
    8A4D3B1D1297F      :REM*120
115 DATA 91D16860A4D3B1D10980 9
    1D160930D0D1C20204E 4F20424
    F4F4B20494E20      :REM*127
116 DATA 4D454D4F52590D0D0D0D 1
    F00A50129FE850160A5 0109FF8
    50160AD3A030A      :REM*149
117 DATA AA6018AD3A036940D015 E
    E3A03A205D0090D0D20 0020129
    3A206BDB795F0      :REM*114
118 DATA E320D2FFCA10F520A295 B
    D01A085FBE8BD01A085 FCE6FBD
    002E6FCA9008D      :REM*203
119 DATA 340360C8C8A92020D2FF B
    1FBC820D2FFC90DD0F6 A92020D
    2FFB1FBC907B0       :REM*66
120 DATA ED8D3B03C8B1FB8D3E03 A
    90D20D2FF6020949520 BE95A00
    0B1FBF021C9FF      :REM*254
121 DATA F01DA90D20D2FF20E595 C
    8B1FB300D1865D6C918 B00620B
    5964C169620C4      :REM*156
122 DATA 98A93E20D2FFA99D20D2 F
    F206E95209B9520E4FF F0FBAE8
    E02E004D028C9       :REM*11
123 DATA 09F067C904D0034CD999 C
    910D0034C919BC905D0 034CEB9
    AC911D0D7209B      :REM*238
124 DATA 95A99320D2FF4C74A4C9 1
    1F027C991F026C90DF0 25C985F
    01EC988F017C9      :REM*186
125 DATA 86F010C987F00CC93FD0 A
    CA9018D35034C5A9E4C 939B4C7
    8984CE2984C00      :REM*152
126 DATA 94AD3E031865FB85FBA9 0
    065FC85FC6020B49AA9 00A0982
    01EABAD3C038D        :REM*2
127 DATA 8602A5FB8D3F03A5FC8D 4
    003A0008C3E038C3B03 84FDA9C
    085FE2060A5A2      :REM*195
128 DATA 00AC3E03BD0002F00D91 F
    DC8EE3E03E8E026F006 D0EEE00
    1F014A90D91FD       :REM*13
129 DATA EE3E03EE3B03AE3B03E0 0
    690D1EE3E03AD3B03D0 034C109
    6EE3E03209495      :REM*251
130 DATA AD3E038D36031869028D 3
    E03186D01A0AD02A069 00C9C09
    019209B95A952      :REM*168
131 DATA A098201EABA961A09820 1
    EAB20E4FFF0FB4C0094 A000B1F
    B8D3703AD01A0       :REM*48
132 DATA 85FBAD02A085FC18A5FB 6
    D3E0385FD8D01A0A5FC 690085F
    E8D02A0AD3703      :REM*153
133 DATA D008E6FBD02BE6FCD027 A
    000B1FB91FDA5FBCD3F 03D007A
    5FCCD4003F013      :REM*208
134 DATA A5FBD002C6FCC6FBA5FD D
    002C6FEC6FD4C9097A9 BF85FEA
    9FE85FDA00020      :REM*176
135 DATA F497C8B1FD91FBCC3603 D
    0F620F49720A295E8E8 E035B01
    2BD01A0186D3E       :REM*51
136 DATA 039D01A090EEE8FE01A0 B
    0E9A99320D2FF4C1696 AD3B039
    1FBC8AD3E0391       :REM*29
```

```
137 DATA FB60930D54595045204C 4
    94E452F52455455524E 2D2D454
    E4420424C414E      :REM*130
138 DATA 4B204C494E452F524554 5
    5524E0DB2B2B2B2B2B2 B2B2283
    6204C494E4520        :REM*4
139 DATA 3C333820535043533E20 4
    D415829B2B2B2B2B2B2 B2B20D0
    02020424F4F4B       :REM*56
140 DATA 2046554C4C210D0D0020 2
    0285052455353204B45 5920544
    F20434F4E542E       :REM*65
141 DATA 2900AD3403F019CE3403 A
    92020D2FFAE3B03A90D 20D2FFC
    A10FA20B5964C      :REM*127
142 DATA 3D96A92020D2FFA90D20 D
    2FF209495A000B1FBF0 0AC9FFD
    01120B0954C3D      :REM*181
143 DATA 96A2018E3A0320B3954C 3
    D9620E5954C3A96AE3B 03A9912
    0D2FFCA10FAA9       :REM*20
144 DATA 018D340360A5FBD002C6 F
    CC6FBA000B1FB602094 95A5FB8
    D3F03A5FC8D40      :REM*222
145 DATA 03A92020D2FFA99D20D2 F
    FAD3403F018CE3403A6 D6D0092
    06CE920BD994C      :REM*133
146 DATA 3D96A99120D2FF4C3D96 2
    0D598C9FFD050A203E4 D6901CF
    01ACA8E3B0320      :REM*194
147 DATA 9B99A91120D2FF4C4499 A
    203A99120D2FFCAD0F8 60A2022
    0369920B39520       :REM*30
148 DATA 349920D598CE3A03F003 4
    C3D96A21A8E3A03AD02 A085FCA
    D01A085FBE6FB       :REM*31
149 DATA D0EAE6FC4C3D968D3E03 A
    9018D340320D5988D3B 0338AD3
    F03ED3E0385FB      :REM*230
150 DATA AD4003E90085FCAD3B03 C
    5D69006209B9920E595 4CC198A
    E3B03E88A38E5      :REM*205
151 DATA D68D3F03A2008E4003A2 0
    086D6206CE9EE4003AD 4003CD3
    F0390EEA5D909       :REM*77
152 DATA 8085D918A200A00020F0 F
    F604E2F59203F455445 4C45442
    020AD3403D003      :REM*141
153 DATA 4C4D96209495A5D68D36 0
    320B49AA00020E595A0 0CB9CC9
    920D2FF8810F7       :REM*96
154 DATA AD3C038D860220E4FFF0 F
    BC959F014A6D620FFE9 AE3603A
    0001820F0FF20      :REM*214
155 DATA E5954CC198AE360320FF E
    9E8E019D0F8AE3603CA 1005A90
    120A399A00018       :REM*23
156 DATA 20F0FF20469AA0008C34 0
    34C1696A5FB85FD8D3F 03A5FC8
    D400385FE20B5      :REM*251
157 DATA 96A000B1FB91FDC900F0 0
    9C8D0F5E6FCE6FED0EF 38AD01A
    0ED3E038D01A0       :REM*55
158 DATA B003CE02A0AD01A085FD A
    D02A085FEA900A8C891 FDCC3E0
    3D0F820A295E8      :REM*187
159 DATA E8E035B01238BD01A0ED 3
    E039D01A0B0EEE8DE01 A0D0E9A
    D3F0385FBAD40      :REM*208
160 DATA 0385FC60AD86028D3C03 A
    9028D860260930D0D20 4849542
    052455455524E      :REM*123
161 DATA 20464F52204541434820 4
    34F5252454354204C49 4E450D0
    D4544495400AD       :REM*40
162 DATA 3403D0034C4D9620B49A A
    9C0A09A201EABA906A0 98201EA
    BAD3C038D8602       :REM*80
163 DATA 209495AD3E0338E9048D 3
    603A002B1FB20D2FFC8 CE3603D
    0F5AE3B032036       :REM*42
164 DATA 9920469A209B954CD496 0
    D30295052494E542043 4D504C5
    420454E545259      :REM*138
165 DATA 3F0D31294F4D4954204C 4
    15354204C494E453F0D 32294F4
    D4954204C4153       :REM*66
166 DATA 542032204C494E45533F 2
    0202028302F312F322F 3329203
    F0D3329524554      :REM*165
167 DATA 55524E20544F20494E44 4
    5583F0D00A9008D3803 AE3B03A
    91120D2FFCA10      :REM*173
168 DATA FA20B49AA6D68E3603A0 0
    08C3703206CE9AE3603 EE3703A
    D3703C906D0F0       :REM*67
169 DATA B5D9095095D9A932A09B 2
    01EABAD3C038D860220 E4FFF0F
    B4930C904B0F5       :REM*84
170 DATA 8D3703C903D0034C0094 A
    90020BDFFA904AAA000 20BAFF2
    0C0FFA20420C9      :REM*201
171 DATA FF209495A000B1FBF04C C
    9FFF0398D3B0338ED37 038D360
    3A200C8B1FB8D       :REM*41
172 DATA 3E03AD3603F0183016C8 B
    1FB20D2FFC90DD0F6E8 EC3603D
    0F020D2FF20D2       :REM*83
173 DATA FFAD3803F01420B596D0 B
    DAE3803E086F008E6FB D0B2E6F
    CD0AE20CCFFA9       :REM*45
174 DATA 0420C3FF4C1096930D53 4
    1564520544849532042 4F4F4B3
    F20000D0D4E45      :REM*237
175 DATA 5720424F4F4B204E414D 4
    53F0D0D00930D1C4C4F 4144204
    E455720424F4F      :REM*121
176 DATA 4B3F1F00930D1C535441 5
    254204E455720424F4F 4B3F1F0 ►
```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Software by
David Bunch, Michael Kosaka, Stephen Landrum

Circle 142 on Reader Service card.

```
    0A0FFE8C8B900              :REM*233
177 DATA 029D4103D0F68AA241A0 0
    320BDFF6053303A1C0D 0D53435
    2415443482004F             :REM*214
178 DATA 4C442046494C453F201F 0
    00D4E414D453F0D00A2 008E370
    34C799DA9C0A0              :REM*146
179 DATA 9C201EAB20E4FFF0FB20 D
    2FF48A9D7A09C201EAB 2060A56
    8C94EF023C959              :REM*216
180 DATA F0034CE79CA2FFE8BDBD 9
    C9D4103E002D0F520A8 9CA06FA
    901A20820BAFF              :REM*252
181 DATA 20D5F3A2FF20A89CA902 A
    8A20820BAFF209495A9 0185FDA
    9A085FEA9FDAC              :REM*217
182 DATA 02A0AE01A0E8D001C820 D
    8FF209B95AE3703E001 F005B03
    74C00944CE39D              :REM*160
183 DATA A981A09C201EAB20E4FF F
    0FBC959F002D0E8A202 8E3703A
    95BA09C201EAB                :REM*4
184 DATA 20E4FFF0FB20D2FFC94E F
    0C7C959D0E94CE79CA9 6EA09C2
    01EAB2060A5A2               :REM*26
185 DATA FF20A89CA902A8A20820 B
    AFF209495A900AAA0A0 20D5FFB
    004C0C90034C               :REM*119
186 DATA 209E84FC8AA8A90085FB F
    04BA994A09C201EAB20 E4FFF0F
    BC959F0034C00                :REM*9
187 DATA 94A9018D37034C799D20 9
    495A9A085FCA90085FB A001A95
    091FBA9A0A237               :REM*43
188 DATA C891FBC8488A91FB68E8 C
    8C03790F288A9FF91FB C8C051D
    0F9A90091FBC8              :REM*251
189 DATA D0FBE6FCA6FCE0C0D0F3 2
    09B954C0094A9FF8537 A993853
    8AD00038D589E               :REM*74
190 DATA AD01038D599EA94A8D00 0
    3A99E8D01032044A64C 0094E00
    BD007C92CD003               :REM*43
191 DATA 4C00946C589E000A97F A
    09E201EABA93FA09F20 1EABA96
    1A098201EAB20               :REM*87
192 DATA E4FFF0FBAD3503F0034C 1
    0964C0094930D0D1249 4E44455
    8205041474592              :REM*211
193 DATA 0D0D20202043555253 4F 5
    2205550 2F444F574E0D 202020 5
    2455455524E20              :REM*111
194 DATA 53454C454354532 04D45 4
    D4F205041474 50D2020 2012519
    220544F205155               :REM*40
195 DATA 4954 0D0D2020202046 3
    2292 0494E5354414C4C 20424C4
    14E4B20424F4F               :REM*45
196 DATA 4B0D2020202020463429 2
    05341564520424F4F4B 0D20202
    02020463629 20             :REM*151
197 DATA 4C4F4144204E45572042 4
    F4F4B0D0D494E535441 4C4C204
    24F4F4B204245               :REM*38
198 DATA 464F524520 53454C4543 5
    4494E47204D454D4F20 5041474
    50D0D0124D45               :REM*243
199 DATA 4D4F2050414745539 20D 0
    D20205245545552 4E20 53454C4
    543545320494E               :REM*14
200 DATA 4445582050414745 0D0D 2
    0201243 4E54524C923A 2012499
    24E5345525420               :REM*40
201 DATA 12459244495420124492 4
    54C4554452012509252 494E542
    0125192554954              :REM*192
202 DATA 0D0D2020202020463 12F 4
    6372 03D2043555253 4F 5220555
    02F444F574E0D              :REM*227
203 DATA 202020202046332920 50 5
    2494E4205041474520 46524F4
    D20435552534F              :REM*127
204 DATA 520D20202020204635 29 2
    050 52494E5420424F4F 4B20465
    24F4D20435552              :REM*141
205 DATA 534F520D0D00        :REM*105
206 DATA -1                    :REM*60 ■
```

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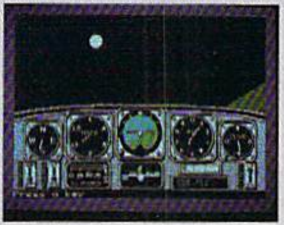

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Calendar Maker

Make some dates with your Commodore and get 1988 off to a good start.

◇

By BOB KODADEK

Let's start off the New Year with a seasonally appropriate application that most Commodore owners can enjoy—a C-64/C-128 calendar program. Calendar Maker employs a perpetual calendar to display and print out any month of any year you choose.

You can use it to create a 1988 calendar or to look into the future or the past to find out the day of the week of a particular event. Want to know if your birthday will fall on a weekend in the year 2001? Calendar Maker can promptly tell you.

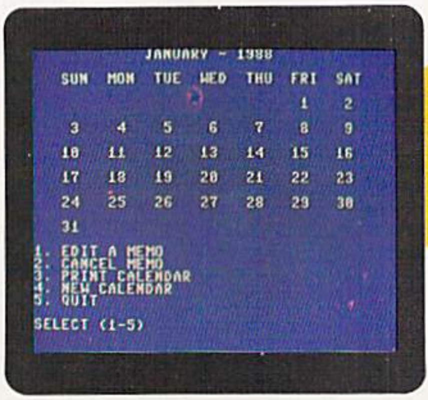
The program can also help you organize your monthly schedule. For each day of the month you can enter up to six memos, each containing a maximum of ten characters. As the calendar is displayed on the screen, any date containing memos appears in reverse video, so you can easily select it to view, edit or delete the memos. All memos appear under the correct date when the calendar is printed.

CREATING A CALENDAR

Type in and save Listing 1, being careful to include the semicolons in the Print and Print# statements. They suppress unwanted carriage returns, and if you inadvertently omit one, the ensuing text will appear on the line following where it should be. (Of course, this holds true for any Basic program listing you type into your Commodore.)

To use Calendar Maker, just load and run the Basic program. It will request the month and year of the calendar you want displayed and check to make sure your responses are in the proper range. You must enter the year as a four-digit number—such as 1988.

When the calendar you requested appears, it'll be accompanied by a menu with the following choices:



```
            JANUARY - 1988
  SUN  MON  TUE  WED  THU  FRI  SAT
                            1    2
   3    4    5    6    7    8    9
  10   11   12   13   14   15   16
  17   18   19   20   21   22   23
  24   25   26   27   28   29   30
  31
1. EDIT A MEMO
2. CANCEL MEMO
3. PRINT CALENDAR
4. NEW CALENDAR
5. QUIT
SELECT (1-5)
```

Sample Calendar Maker screen display.

1. Edit a memo
2. Cancel a memo
3. Print a calendar
4. New calendar 5. Quit

Each time you elect to edit or cancel a memo, Calendar Maker will prompt you to enter the date of that memo and make sure your input is in the correct range. The range is displayed in the prompt. Note that, since 1988 is a leap year, the range for February is 1–29.

If you choose to edit a memo, a block representing the date and containing six numbered lines will appear in reverse video, with any memos you've already input for that date displayed and the cursor poised on line 1. Enter or edit up to ten characters in line 1, remembering to enclose the text in quotes if it includes a comma or colon. (The quotation marks aren't counted in the ten characters.) When you're done with line 1, press the return key to advance to line 2. If you fail to press return, an error will occur.

You can enter text on each of the six lines, and the lines can constitute separate memos or all be part of one. Should you need fewer than six lines, just press return at each number to advance to the end of the list. When you press return on line 6, the program will redisplay the lines and ask if they're all right. If you need to make corrections, press N.

Once you press Y, the calendar will appear again with the memo date in reverse video, showing that a memo exists in that spot. Then you can move on to enter or edit memos for other dates or choose a different menu option.

To cancel all the memo lines for a day, select the Cancel option in the main menu.

PRINTING A CALENDAR

When you're ready to print your calendar, turn on your printer and adjust the paper so the print head is one or two lines down from the top. Then select the Print Calendar option from the menu. The print routine is fairly universal, so it'll probably work on your printer.

If you'd like to alter the appearance of the printout, you can make your own substitutions for the CHR$(221) in line 60, which creates the vertical lines, or the CHR$(45) in line 90, which creates the horizontals.

It's also possible to alter the dimensions of the calendar by changing the number of lines printed per inch. If you have a Commodore 1526 or MPS-802 printer, try adding the following line ►

RUN it right: **C-64; C-128 (in 40- or 80-Column mode); printer optional**

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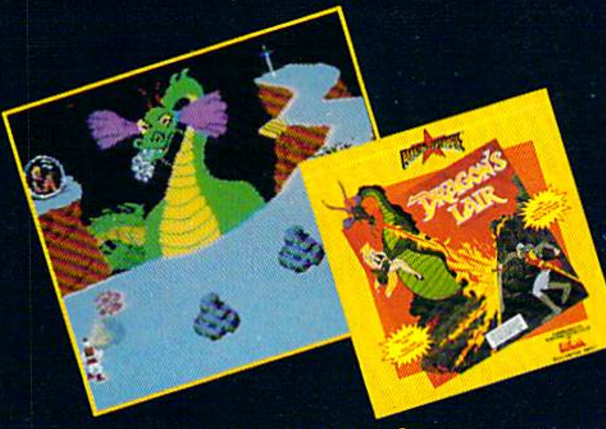
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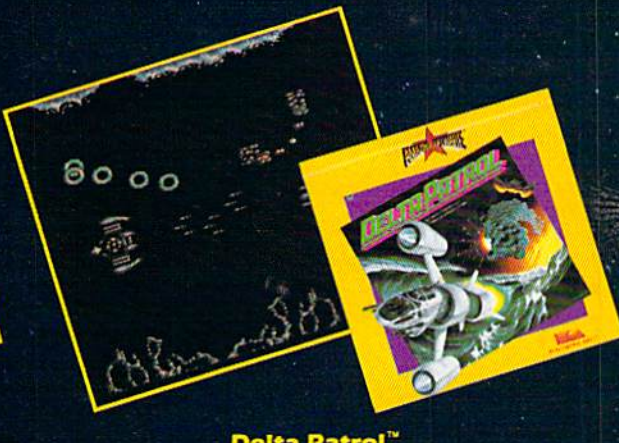
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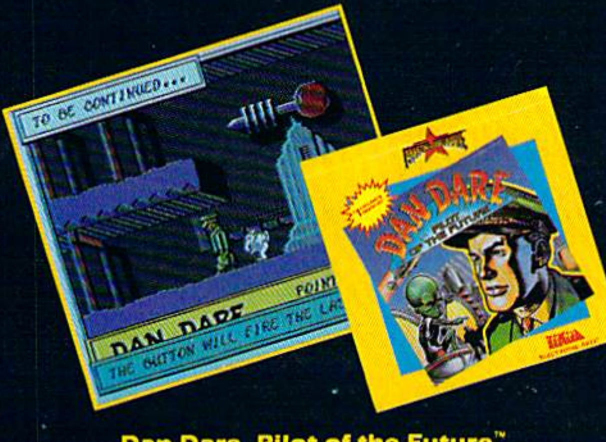
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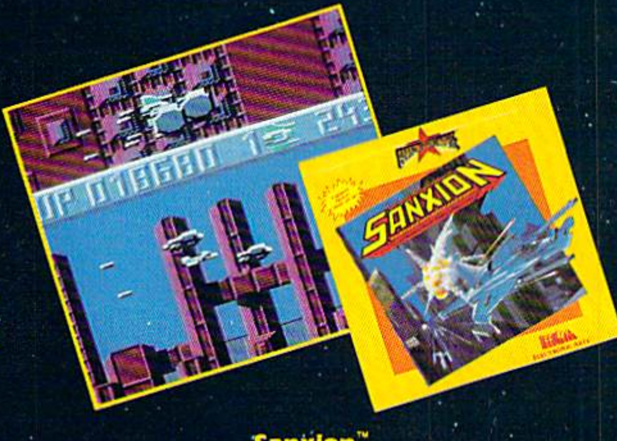
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ELECTRONIC ARTS®

Circle 211 on Reader Service card.

to the Basic listing to change the line spacing:

```
455 OPEN 5,4,6:PRINT#5,CHR$(23):
    CLOSE 5
```

This change remains in effect until your printer is turned off or reset. If you don't have one of these printers, check your manual to see if and how you can make line-spacing modifications.

To erase the calendar in memory and create another, select the New Calendar option from the main menu. When you are ready to exit the program, choose the Quit option. 🅁

Bob Kodadek is a computer programmer and freelance writer.

Listing 1. Calendar Maker program. (Note: Checksums are for *RUN*'s new checksum program.)

```
10 REM CALENDAR MAKER    :REM*77
20 REM BY: BOB KODADEK :REM*116
30 REM 3164 SURREY LANE:REM*200
40 REM ASTON, PA 19014 :REM*200
50 :                   :REM*108
60 DIM MO$(12),ND(12),MM(50),XM
   $(50,5):U$=CHR$(221):REM*227
70 FOR I=1TO12:READ MO$(I),ND(I
   ):NEXT              :REM*45
80 FOR I=0TO6:READ D$:DY$=DY$+D
   $+"{2 SPACEs}":PD$=PD$+D$+"{
   3 SPACEs}":NEXT     :REM*202
90 FOR I=0TO9:S$=S$+" ":NEXT:FO
   R I=0TO77:H$=H$+CHR$(45):NEX
   T                   :REM*127
100 US$=U$+S$:PRINT"{SHFT CLR}{
    2 CRSR DNs}RUN - CALENDAR M
    AKER":PRINT:GOSUB 590:REM*0
110 GOSUB 690          :REM*208
120 GOSUB 330:K=VAL(A$):IF K<1
    OR K>5 THEN 120    :REM*204
130 IF K=4 THEN PRINT"{SHFT CLR
    }ONE MOMENT...":RUN:REM*103
140 IF K=5 THEN END    :REM*208
150 ON K GOSUB 180,380,430:GOTO
    110                :REM*228
160 :                  :REM*218
170 REM ----- EDIT MEMOS -----
                        :REM*60
180 GOSUB 300          :REM*245
190 PRINT"{SHFT CLR}{2 CRSR DNs
    }MEMOS FOR "MO$(MO)DT
                        :REM*86
200 PRINT"{CRSR DN}{3 SPACEs}>-
    ---------<{2 SPACEs}10 CHAR
    ACTERS EACH":GOSUB 270
                       :REM*116
210 PRINT"{7 CRSR UPs}":FOR I=0
    TO5:INPUT"{2 CRSR RTs}";X$:
    X$=LEFT$(X$,10)    :REM*122
220 IF LEN(X$) <10 THEN X$=X$+C
    HR$(32):GOTO 220   :REM*157
230 XM$(DT+J,I)=X$:NEXT:PRINT
                         :REM*5
240 GOSUB 270:PRINT"{CRSR DN}IS
     THIS CORRECT? (Y OR N)"
                        :REM*19
250 GOSUB 330:IF A$ <> "Y" THEN
     190               :REM*210
260 RETURN             :REM*147
270 FOR I=0TO5:IF XM$(DT+J,I)="
    " THEN XM$(DT+J,I)=S$
                       :REM*163
280 PRINT I+1 SPC(1) CHR$(18) X
    M$(DT+J,I):NEXT:RETURN
                       :REM*100
290 :                   :REM*93
300 PRINT"ENTER MEMO DATE{2 SPA
    CEs}1 -"ND(MO):INPUT DT
                        :REM*16
310 IF DT <1 OR DT >ND(MO) THEN
     PRINT"{3 CRSR UPs}":GOTO 3
    00                 :REM*182
320 MM(DT)=1:RETURN     :REM*81
330 :                  :REM*133
340 A$="":GET A$:IF A$="" THEN
    330                 :REM*94
350 RETURN             :REM*237
360 :                  :REM*163
370 REM ------ CANCEL MEMO ----
    --                  :REM*85
380 GOSUB 300:MM(DT)=0:FOR I=0T
    O5                  :REM*69
390 XM$(DT+J,I)=S$:NEXT:REM*209
400 RETURN              :REM*28
410 :                  :REM*213
420 REM ------ PRINT CALENDAR -
    -----              :REM*127
430 PRINT"{SHFT CLR}{3 CRSR DNs
    } TURN ON PRINTER":PRINT"{C
    RSR DN}READY? (Y OR N)"
                       :REM*194
440 GOSUB 330:IF A$ <> "Y" THEN
     RETURN            :REM*101
450 CLOSE 4:OPEN 4,4:C=0:C1=1:N
    =0                 :REM*117
460 L=LEN(MO$(MO))/2:PRINT#4,CH
    R$(14) SPC(16-L) MO$(MO)" -
    " YR                :REM*22
470 PRINT#4,CHR$(13) CHR$(13) C
    HR$(14)LEFT$(PD$,39):PRINT#
    4,CHR$(15):PRINT#4,H$
                       :REM*166
480 FOR I=1TOY:FOR T=0TO6:C=C+1
                        :REM*19
490 IF C=<J OR N=>ND(MO) THEN P
    RINT#4,US$;:GOTO 520:REM*88
500 N=N+1:N$=" "+MID$(STR$(N),2
    )                  :REM*145
510 PRINT#4,LEFT$(US$,7)CHR$(14
    )RIGHT$(N$,2)CHR$(15);
                       :REM*248
520 NEXT T:PRINT#4,U$  :REM*180
530 FOR T1=0TO5:FOR T2=0TO6
                       :REM*173
540 IF XM$(C1+T2,T1)=""THEN PRI
    NT#4,US$;:GOTO560    :REM*7
550 PRINT#4,U$+XM$(C1+T2,T1);
                        :REM*46
560 NEXT T2:PRINT#4,U$:NEXT T1:
    C1=C1+7:PRINT#4,H$   :REM*9
570 NEXT I:PRINT#4:CLOSE 4:RETU
    RN                  :REM*68
580 :                  :REM*124
590 REM ------ GREGORIAN DATE -
    -----               :REM*43
600 INPUT"ENTER MONTH (1-12)";M
    O:IF MO <1 OR MO>12 THEN PR
    INT"{2 CRSR UPs}":GOTO600
                       :REM*194
610 INPUT"ENTER{2 SPACEs}YEAR (
    YYYY)";YR:IF YR <1583 THEN
    PRINT"{2 CRSR UPs}":GOTO610
                       :REM*147
620 Q=YR+(MO<3):J=INT(275*MO/9)
    -INT((7*Q+7)/4)+367*YR+1-IN
    T((INT(Q/100)+1)*3/4)
                       :REM*189
630 J=J-4-7*INT((J-4)/7):X=(ND(
    MO)+J)/7:Y=INT(X):IF X>Y TH
    EN Y=Y+1            :REM*62
640 IF(YR/100)-INT(YR/100)=0 AN
    D (YR/400)-INT(YR/400)<>0 T
    HEN RETURN          :REM*19
650 IF (YR/4)-INT(YR/4)=0 AND M
    O=2 THEN ND(MO)=29 :REM*134
660 RETURN              :REM*33
670 :                  :REM*218
680 REM ----- PRINT SCREEN ----
    -                  :REM*167
690 L=LEN(MO$(MO))/2:PRINT"{SHF
    T CLR}"SPC(16-L) MO$(MO)" -
    " YR               :REM*207
700 PRINT:PRINT SPC(3) DY$:PRIN
    T:C=0:N=0           :REM*41
710 FOR I=1TOY:FOR T=1TO7:C=C+1
    :IF C=<J THEN PRINT SPC(5):
    GOTO 750             :REM*2
720 IF N=>ND(MO) THEN 750
                       :REM*192
730 N=N+1:N$=" "+MID$(STR$(N),2
    ):IF MM(N) THEN PRINT CHR$(
    18);               :REM*176
740 PRINT SPC(3) RIGHT$(N$,2) C
    HR$(146);          :REM*147
750 NEXT T:PRINT:PRINT:NEXT I
                        :REM*13
760 PRINT"1. EDIT A MEMO":PRINT
    "2. CANCEL MEMO":PRINT"3. P
    RINT CALENDAR"      :REM*88
770 PRINT"4. NEW CALENDAR":PRIN
    T"5. QUIT"         :REM*116
780 PRINT"{CRSR DN}SELECT (1-5)
    ":RETURN           :REM*100
790 :                   :REM*83
800 DATA JANUARY,31,FEBRUARY,28
    ,MARCH,31,APRIL,30,MAY,31,J
    UNE,30,JULY,31     :REM*217
810 DATA AUGUST,31,SEPTEMBER,30
    ,OCTOBER,31,NOVEMBER,30,DEC
    EMBER,31            :REM*93
820 DATA SUN,MON,TUE,WED,THU,FR
    I,SAT               :REM*48
```

■

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GEOWATCH

Advice on using printers and the 1581 disk drive with GEOS highlights this month's column.

By MATTHEW STERN

THE GEOWATCH MAILBAG has been overflowing, with most of the questions concerning hardware, especially printer, compatibility. Answering is difficult, because of the variety of printers available, all of which work somewhat differently. However, I do have some general suggestions.

First, use printers and interfaces that have been proven compatible by Berkeley Softworks, the developer of GEOS. You'll find a list in your *GEOS User's Guide* and in last August's geoWatch.

Second, make sure your interface is set correctly. Printer interfaces are normally configured with DIP switches. For my Epson RX-80, I turn the automatic linefeed off and Transparent mode on, and I set the device number to 4.

Finally, use the correct printer driver. There are now three sets of printer drivers for GEOS: the original set that comes with the boot disk, an enhanced set that comes with Writer's Workshop and a special set for the geoPrinter Cable. If you're using Writer's Workshop and some of the newer GEOS applications, you need the new drivers; the original ones on the boot disk won't work. If you're using the geoPrint Cable, use a driver with a filename ending in (GC). Copy the driver so it's the first file on the boot disk, and it'll be selected automatically when you start GEOS.

Now, for some questions:

Q *I'd appreciate answers to the following questions relating to GEOS: 1. Besides using the space bar (which is slow), is there any way to position the cursor beyond the last character in a line, for purposes like placing the return address in the upper-right portion of a letter. Also, is there a quick way to set the cursor? 2. When bringing a graphic into a geoWrite file, I've noticed that it's always centered horizontally and that only one graphic can be placed on the line. Can I change its position, and is it possible to locate more than one graphic on a line?*

—S. E. FELLERMAN
KENSINGTON, MD

A To move the cursor within a line of existing text, you can either move the pointer to the desired location and click, or, with geoWrite version 1.3 or later, use the cursor keys. Pressing control/I moves the cursor beyond the last character to the next tab stop. GeoWrite positions a pasted-in photo scrap between the margins, and, by moving the margins, you also move the graphic. If you want a graphic to be flush left, move the right-margin icon to the left until the graphic is in the correct position. Changing the margins reformats all the text below the ruler. Writer's Workshop lets you use various margin settings in your document. With geoWrite 1.2 and 1.3, you have to use the same settings throughout.

With geoWrite, you can have only one photo scrap in a line. However, you can have a second picture or some text alongside a graphic if it's in the same geoPaint file and included as part of the photo scrap. For laser-printed quality, use the overlay feature in the Writer's Workshop geoLaser program.

Q *I just updated my system from a C-64/1541 combination to the C-128/1581, and I noticed rather quickly that it's impossible, using any copy program, to transfer the GEOS boot disk over to the micro-floppies. Not only that, even the latest GEOS update (from the mouse package) doesn't let me take advantage of two disk drives. I hope you can answer the following questions concerning these problems: 1. Is any form of GEOS compatible with the 1581 drive? 2. If I update my boot disk to 128 mode, will it work on a 1541 drive, or must I change over to a 1571? 3. Is GEOS going to be made available on micro-floppies?*

—JOSEPH C. HAMPTON, JR.
JERSEY CITY, NJ

A The GEOS 128 with deskTop 1.4 is the only version that supports the 1581 drive. With GEOS 128, you get two 5¼-inch boot disks that run on the 1541 or 1571. There's no 3½-inch boot disk available now, and Berkeley hasn't announced any plans to offer one.

In the meantime, you can use your 1581 as a second disk drive with GEOS. Set your 1541 or 1571 as device 8 (which will appear as drive A on the deskTop) and your 1581 as device 9 (drive B). Boot with the original GEOS disk in the 5¼-inch drive, and use the 128 Configure program on the original disk to check and save your disk drive configuration. As formatted by GEOS, 3½-inch disks can store up to 790K, which provides plenty of space for files, fonts and applications.

You need to be aware of a few things as you use 3½-inch disks with GEOS. First, it doesn't support partitions. If you partition a 3½-inch disk with Basic, it won't convert properly to GEOS format. Second, you can't copy a 5¼-inch disk directly to a 3½-inch disk. Instead, you must copy files individually by dragging them to the disk icon. (You don't have to swap disks while doing this, which is the beauty of having two drives.)

Use a good quality double-sided, double-density 3½-inch disk. (I prefer Sony MFD-2DDs.) They may cost more than single-sided disks, but I find them more reliable.

The 1581 drive is considerably faster than the 1541 and 1571. In spite of some limitations, its speed and storage capabilities make it an excellent enhancement for GEOS.

Thanks to all of you who've taken the trouble to write; I appreciate your questions and comments. In next month's column, I'll take a look at the latest third-party GEOS software and hardware. Keep watching! ■

The monthly geoWatch column addresses the needs of RUN readers who use GEOS, Berkeley Softworks' alternative operating system for the C-64 and C-128. Your questions and comments are welcome. Send them to:

Matthew Stern
geoWatch
RUN Magazine
80 Elm St.
Peterborough, NH 03458

You can also contact Matthew Stern on QuantumLink. His online name is Matt S3.

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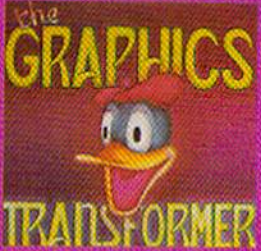

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1541 AUNTIE BUMP BOARD – $49.95
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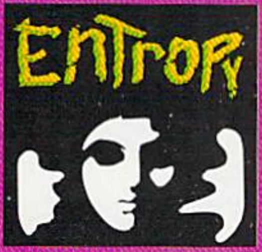
“. . . it's surprising that the generic mortal species hadn't come up with a device to ELIMINATE the damaging knock on the 1541 disk drive before now. After looking at the circuit board, I've come to the conclusion that they did it almost as good as the Vorkons could've . . .”



ENTROPY – $29.95
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? ? ? ? ? ? ? (The Hitchhiker's Guide to Galaxian Software)

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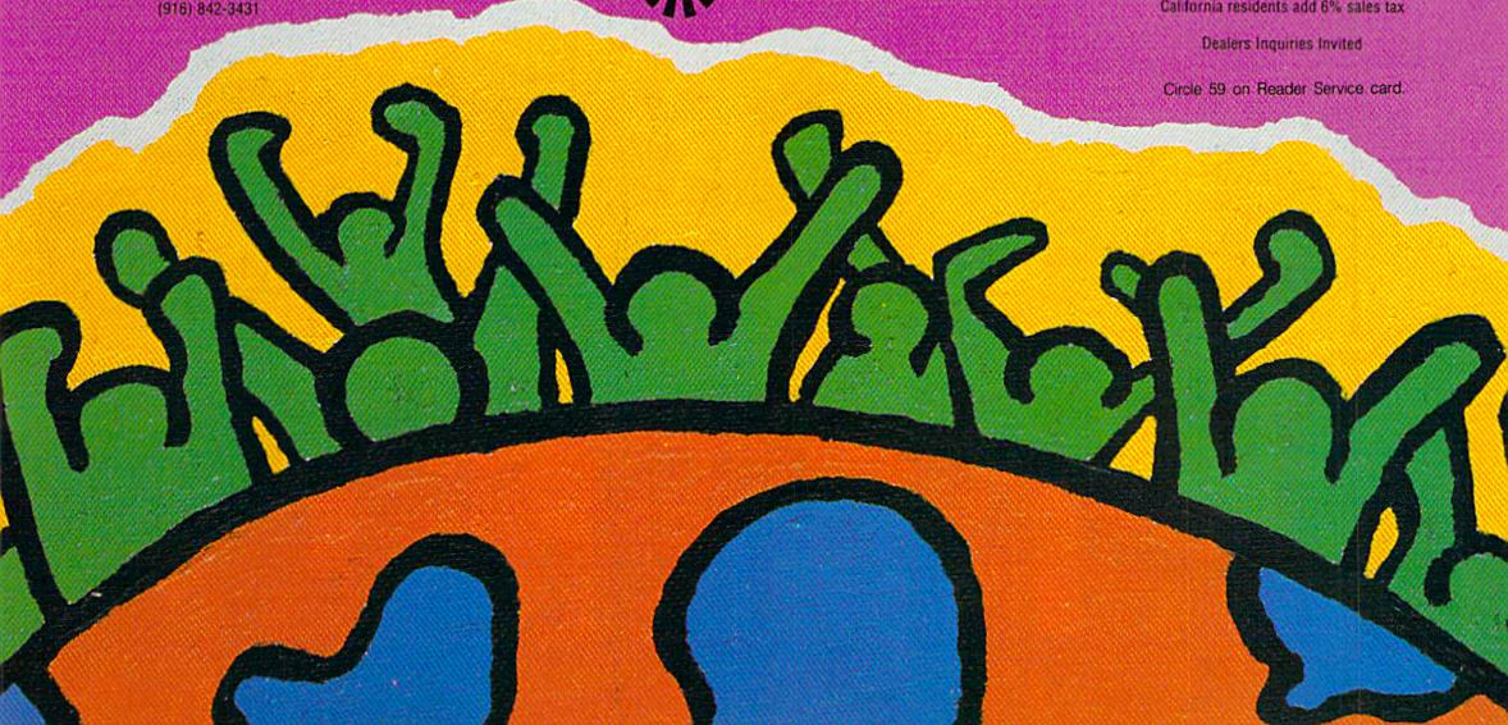

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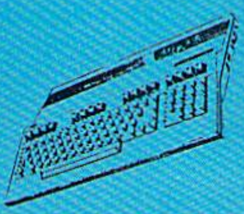

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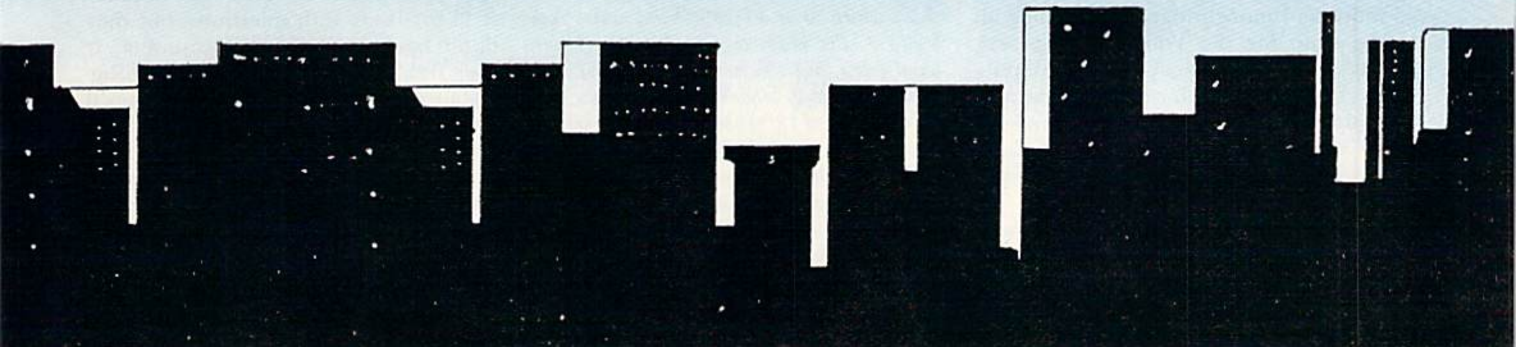


TELECOMPUTING WORKSHOP

This month: interfacing a C-64 and a Macintosh through a modem, uploading difficulties with Xmodem, and more.

By DAVID BRADLEY

HAPPY NEW YEAR, EVERYONE! As we enter 1988, one of my fondest wishes is that the FCC doesn't decide to make online systems like QuantumLink and PeopleLink too expensive to be used by we the people.

I've received many letters relating to my answer in last September's issue to Jake Stack, who was having trouble getting his VicModem 1600 to work.

Jim Stevens from Sanford, North Carolina, reports that if you have a "newer" phone system and you follow the instructions in the modem manual (disconnect the cord from the handset and plug it into the modem after you hear a carrier), you'll never get onto a BBS, because the phone system will hang up as soon as you disconnect the cord.

Marvin Forman of Jackson, Michigan, thinks the 1600 may not work with electronic phones.

John Riederer of Streamwood, Illinois, suggests that Jake run an experiment by pretending a friend's phone is a BBS. When the friend answers, Jake can disconnect his handset as if he were calling a BBS, then plug it back in as if the handset were the modem. If he hears a dial tone, that's because when the caller disconnects, even for an instant, the phone hangs up.

John continues, "I realize that some modems are cheaper, but remember, you get what you pay for. I used to own a VicModem, but now I have the Volks 6480. However, I'm not happy with that, either, because it's not compatible with any software (to my knowledge) other than the software packed with it. I hear that Anchor has a new program for it. I wish they'd given us that one in the first place!"

In response to John's letter, there are more and more programs available all the time for the Volks 6480/Aprotek 12C. I'm now aware of four or five public domain and shareware programs that work with it. Of course, I know of 30 or more that work with the Commodore 1650 and at least 25 that work with the 1670.

Now for this month's questions and answers:

Q *I was just reading your article "Plug into Telecommunications" in last September's issue of* RUN, *in which you stated that the Volks 6480 isn't easy to use. Boy, are you wrong! My Volks came with Commterm 64, and it holds up to 30 BBS phone numbers. I use it to talk to friends and BBSs with no problem at all.*

—MARVIN AUERBACH
NEW YORK, NY

A I'm glad you're enjoying your modem and telecomputing, but many people have had a lot of trouble with the Volks 6480/Aprotek 12C when they've tried to use other software with it. As I've said before, it is a fine modem; it just doesn't work like any others, so you're limited when it comes to software.

Q *I own a C-64 and a MasterModem, which is a 110/300-baud unit from Video 7. I'm ready to dive into the 1200-baud craze, but I'm not ready to spend the money on a new modem. I know I can run my computer at 1200 baud via programming, and I'm not worried about the software for the modem, because I can write my own. I can also do circuitry work, as I've built my own memory expanders before. Is it feasible to disassemble the housing on my modem (at my risk of course) and change the circuitry to operate at 1200 baud?*

—EARL BUCKELAW
SIOUX FALLS, SD

A I think you'll find there's more to making your modem operate at 1200 baud than making slight changes in the circuitry. The company that manufactures the Pocket Modem (a Commodore 1650 clone) offers an upgrade service for their 300-baud model to 300/1200-baud. From what I've heard, the operation involves removing one chip and replacing it with an entirely different circuit board that plugs into the empty socket. They may be able to offer some help or guidance with your project. Contact Bot Engineering, 7393 Twiss Rd., Campbellville, Ontario, Canada L0P 1B0; 416-876-4301.

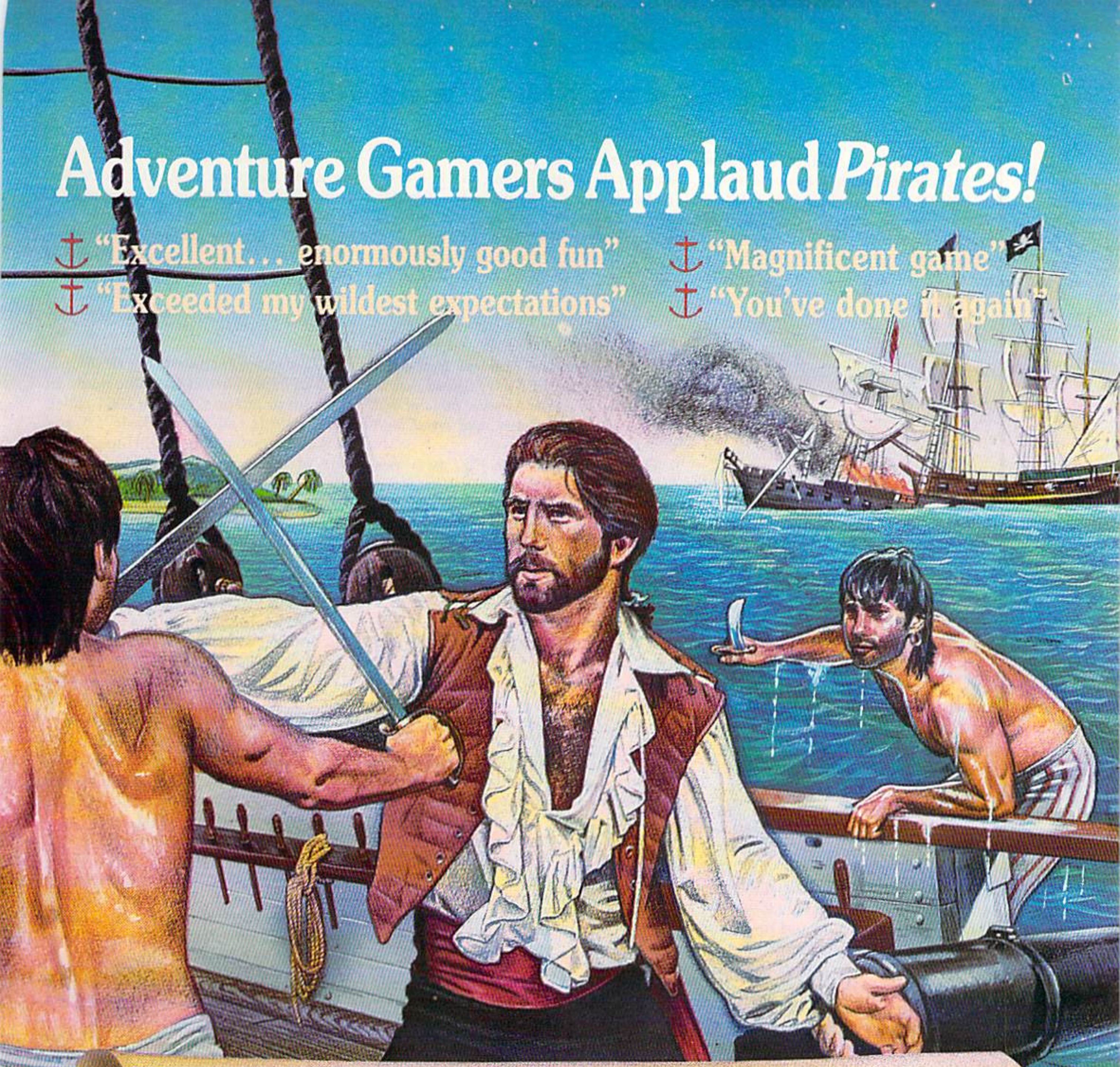
I'm not saying that what you want to do can or cannot be done; just about anything is possible. However, you may find that the parts and time involved in converting your modem may make the project more expensive than picking up another unit like the 1670, which now sells in a lot of places for less than $150.

Q *I'd like to get into telecommunications and join Q-Link, but I live in a small town and the nearest Q-Link outlet is 50 miles away. The long-distance phone bills would be much more than I could afford. Does Q-Link have a toll-free log-on number for all of us who don't live near a large city, or do they plan on providing this service? I think if they did, they'd attract many more patrons.*

—ANDY SWENSON
WHITEHALL, WI

A Q-Link has a voice 800 number for users with questions, but they don't have an 800 log-on number. If they did, they'd have to pay the long-distance phone bills, and then they'd have to turn around and charge a lot more for access via the 800 number. That would probably cost you just as much as, if not more than, the present system.

I suggest that, if you want to get into ►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telecommunications, you get a modem and use a local bulletin board system. You can get a lot out of a free BBS.

If there isn't a BBS in your area but you have a friend in that large city, perhaps you could occasionally take your computer and modem to visit him or her for a day.

Q *I have a C-64 and am planning to get an Apple Macintosh, too. When I have both machines, I'd like to interface them through a modem. Will that be possible, and if so, will I be able to transmit at 2400 baud? Also, my father works for a company that makes modems for the Macintosh and the IBM-PC. Would one of those work with my Commodore?*

—MARK ZELLER
DUNSTABLE, MA

A Interfacing the C-64 and the Macintosh by modem should be possible, but you will need an RS-232 interface for both machines. The Macintosh comes with an RS-422 interface, which is just a souped-up version of the RS-232. You can get an RS-232 interface for your C-64 from Aprotek (1071-A Avenida Acaso, Camarillo, CA 93010; 805-987-2454) or Omnitronix (760 Harrison St., Seattle, WA 98109; 206-624-4985). You could also build one following the instructions in the November 1987 issue of *The Transactor* (501 Alden Rd., PO Box 3250, Markham Industrial Park, Markham, Ontario, Canada L3R 9Z9).

Another alternative would be to buy a Commodore-specific modem, like the Commodore 1670 or the TCM-1200H (a Hayes clone with a Commodore-ready interface from Trans Com, Inc., 703-13 Annoreno Drive, Addison, IL 60101; 312-543-9055) and an interface for connecting it to any computer with an RS-232 port. Write to LRA Enterprises (35615 Ave. D, Yucaipa, CA 92399) for more information about this RS-232-to-Commodore interface. You should choose a modem that will go directly to the computer you'll use most for telecommunicating.

If the company your father works for makes modems with an RS-232 port, they should have one that you can use with your computers. Internal modems, which plug into a slot inside the computer, might not work, but from what I've seen, most companies make both internal and external units.

I'd suggest you get a 2400-baud modem, if your particular C-64 can communicate that fast and you can afford it. The Macintosh can handle that speed, and, while 2400 baud isn't used extensively in the home market now, it's becoming more and more popular all the time. Even if you get a modem that supports 2400 baud but can't use it right away, you'll be ready when everybody else moves up to that speed.

Q *I own a C-128, a 1571 disk drive and a 1670 modem. I can call local BBSs with no problem, but I can't upload files to them. When I use the Xmodem protocol and try uploading, my modem stops about half-way through the file.*

The read channel to the 1571 stays open (green light on, no flashing), the DIP switches on the back of my 1670 are set correctly, and I establish Xmodem with each BBS before I send. I've tried to upload to several BBSs running on various machines (IBM, Commodore and TRS-80), but the transfer stops half-way through the file every time. The SYSOPs say there's nothing wrong at their end.

What might be wrong with my 1670, and how might I fix it? The 1670 manual is no help.

—GREG GILES
TYLER, TX

A I could answer your question better if you'd given me more information, such as the name of the terminal program you're using, but I'll do my best. Before you blame your modem, try a different terminal program. If you're using Common Sense (the program Commodore sends with the 1670), you might switch to a public domain program such as Third Term or Multi-Term. Both are popular, and you should be able to find them in the TPUG section of Q-Link, from your local user's group or perhaps on a local BBS. To be quite honest, I'm not a big fan of Common Sense. I think Commodore could have provided a more friendly program and should have done a better job on the manual.

You could also try repeating exactly what you have been doing, but on a different C-128 system. The chances of this being a hardware problem are slim, but it's best to explore every avenue.

Another thing you didn't mention was the sort of file you were trying to send and whether it's always the same file that stops in the middle of the transfer. If it is, try another file on a different disk.

Q *I have a C-64, a 1541, an Epson FX-80 printer, a Magnavox 80 monochrome monitor, a Cardco G-Wiz interface and the PaperClip word processor. I've seen 80-column boards advertised and am wondering if they work well. Also, could you recommend an 80-column adapter, and is there an 80-column word processor that would work with the adapter? I use my computer primarily for word processing and telecomputing.*

—JERRY SMITH
WAGONER, OK

A Batteries Included, the developer of PaperClip, at one time made an 80-column adapter for the C-64 called the BI-80. It came with Basic 4.0 and looked fantastic in monochrome. I have one of these interfaces and use it all the time.

Check your original PaperClip disk to see if there's a file called PCLIP64-E-SC-80, or something similar, on it. This is an 80-column version of PaperClip, and it and the BI-80 were made for each other.

Batteries Included has been bought out by Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404; 415-571-7171). Contact EA for more information or for the 80-column version of PaperClip, if it isn't on your disk.

I doubt they'll have a BI-80, though. To find one, you'll probably have to check the used market or poke around on the dusty shelves of your local Commodore dealer (if you have one).

If you can't find the adapter, you can also achieve 80 columns with a C-128 and PaperClip II (the special PaperClip for 128 mode). In fact, depending on how much you have to pay for a BI-80, you might be better off with the C-128. The BI-80 used to cost $200, and if you still have to pay anything like that, you can have a C-128 with all its capabilities for just a bit more.

Also, the BI-80 draws quite a bit of electricity, and if you have a lot of other devices connected to your C-64, it might zap the computer's power supply. If you do get the adapter, you may be able to plug an external power supply into it directly. Later BI-80s included this feature. ■

We invite you to submit your telecommunications tragedies, triumphs and thoughts to:

David Bradley
Telecomputing Workshop
RUN Magazine
80 Elm St.
Peterborough, NH 03458

David Bradley can be contacted on Quantum Link and PeopleLink as DavBradley, on Delphi as DavidBradley and on his own BBS as SYSOP. His BBS number is 813-377-5941, and it operates at 300 and 1200 baud.

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Bounce the ball off the chain-link fence, then go for the basket. Or power through a slam dunk.

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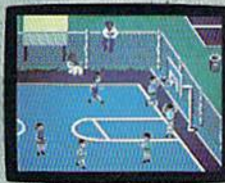

Sometimes it's best to take a pass.

ANOTHER HIT. It's bottom of the ninth. Batter's 0 and 2. The score—well, maybe it's time to take up bridge.

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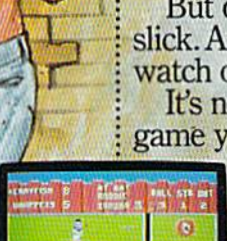

Notice that somebody just stole second base. Funny, it was here a minute ago.

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RUN's Checksum Program

By BOB KODADEK

RUN'S ORIGINAL PERFECT TYPIST programs have been valuable aids, but they're not as perfect as one would like. To improve the situation, we're introducing a new entry program, *RUN*'s Checksum which all programs listed in *RUN* will use beginning with this issue. The most noticeable difference between our new program and the Perfect Typist is that *RUN*'s Checksum serves for both the C-64 and the C-128.

A less obvious difference is that *RUN*'s Checksum uses an algorithm that ensures that every byte of data entered has a unique value, depending on its position in the line. As with Perfect Typist, all you need to do is compare the checksum that appears with the value presented as REM*### at the end of each line in the program listing.

How To Use *RUN*'s Checksum

Type in *RUN*'s Checksum in either 64 or 128 mode and save it to disk before running. When you're ready to type in a program from *RUN*, first load and run *RUN*'s Checksum. It will automatically detect which computer it's running on, make the necessary adjustments and display either the 64 or 128 version on the screen. At this point, you'll also see a SYS number that displays the starting address for activating the checksum. Always use this SYS number to toggle the Checksum on and off.

Pressing the run-stop and restore keys will not disable this utility. In order to turn off *RUN*'s Checksum, enter the SYS command and press the return key. Entering this SYS command again will re-activate the checksum. Be certain to disable *RUN*'s Checksum before attempting to run another program from Basic.

Similarities and Differences

RUN's Checksum retains the features of Perfect Typist and functions in exactly the same way, except that it produces different checksum numbers. Therefore, you cannot use *RUN*'s Checksum to type in listings from any *RUN* issues prior to this one. On the other hand, all listings starting with the January 1988 issue cannot be entered with either the 64 or the 128 Perfect Typist.

Keep the following in mind when you're entering listings: Basic keywords can be abbreviated; spaces affect the checksum only if they appear within quotes; and the order of characters will affect the checksum value. After entering a Basic line and pressing the return key, a one-, two- or three-digit number from 0 to 255 appears in the left-hand margin directly below the line you entered.

If the number matches the checksum value in the program listing, the line is correct, and you may continue. You enter the next line by typing it in directly over the previous line's checksum value. If the number that appears *doesn't* match the listing's checksum value, then proofread the line, comparing it with the magazine listing. Then move the cursor back up to the line and make your corrections. After you press return, the correct checksum value should appear. Continue entering the listing in this manner until all the program lines have been entered, and then deactivate *RUN*'s Checksum, using the SYS number. Save the finished program.

Limitations

While our new checksum utility can find any entry errors, it won't detect an omitted line. If all the checksums match and the program still won't run, look carefully to see that you've entered every line from the listing. Another problem that may occur is a conflict with another resident program, such as the DOS Wedge.

Also, before you attempt to run a new program for the first time, it's good practice to remove any resident programs and cartridges. This can be done by turning the computer off and then on again or by performing a system reset. On the 128, press the reset button on the right-hand side of the computer. 64 users can enter SYS 64738 and press the return key. But, before doing this, make sure you've saved a copy of the new program.

Bob Kodadek has authored many RUN *programs, including the highly popular 64 Notepad.*

Listing 1. *RUN*'s Checksum program.

```
10 REM RUN'S CHECKSUM 64/128 - WRITTEN BY
   BOB KODADEK
20 MO=128:SA=3328:IF PEEK(40960)THEN MO=64
   :SA=49152
30 FOR I=0TO140:READ B:CK=CK+B:POKE SA+I,B
   :NEXT
40 IF CK<>16951 THENPRINT"DATA ERROR!":END

50 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":
   PRINT
60 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO
   =128 THEN 90
70 POKESA+13,124:POKESA+15,165:POKESA+25,1
   24:POKESA+26,165
80 POKESA+39,20:POKESA+41,21:POKESA+123,20
   5:POKESA+124,189
90 POKESA+4,INT(SA/256):SYS SA:NEW
100 DATA 120,162,24,160,13,173,4,3,201,24,
    208,4,162,13,160,67,142,4,3,140
110 DATA 5,3,88,96,32,13,67,152,72,169,0,1
    41,0,255,133,176,133,180,166,22
120 DATA 164,23,134,167,132,168,170,189,0,
    2,240,58,201,48,144,7,201,58,176
130 DATA 3,232,208,240,189,0,2,240,42,201,
    32,208,4,164,180,240,31,201,34
140 DATA 208,6,165,180,73,1,133,180,230,17
    6,164,176,165,167,24,125,0,2,133
150 DATA 167,165,168,105,0,133,168,136,208
    ,239,232,208,209,169,42,32,210
160 DATA 255,165,167,69,168,170,169,0,32,5
    0,142,169,32,32,210,255,32,210
170 DATA 255,169,13,32,210,255,104,168,96■
```

The Great Communicator

The direct-connect® Hayes and Commodore® 1670 compatible 1200 Baud modem for ONLY $89.95

Now that you're able to do all those stand alone applications with your Commodore, like word processing, spread sheet analysis, and many others, you are probably thinking "It would sure be nice if I could expand the amount of data I have access to." You are quite right, everything from Electronic Mail (E-mail) to stock quotes and huge databases of every imaginable type is now on line to the small computer owner. You can even send and receive messages anywhere in the world. All you need is a telephone and a modem which allows your computer to communicate with others through these many services.

The next question is: "Which modem is best for me?" Let us first say that almost all modems (and services) are set up to communicate in one of three speeds; 300, 1200 and 2400 Baud. If you look around you will find that there is a flood of 300 baud modems on the market and sometimes at very low prices. The reason is simple, they are being dumped because most computer users prefer 1200 Baud. (1200 Baud is about 4 times as fast which means you spend about ¼ the time and money getting the data you want and more time enjoying it.)

MINIMODEM-C
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FOR USE WITH COMMODORE C-64, C-64C, C-128 Computers

You may also be wondering about getting a 2400 Baud modem. 2400's are great (and quite expensive), only if you have a dedicated, data-grade phone line. Here's why. The regular phone system doesn't have the signal clarity and bandwidth to support more than about 1200 baud and as a result, 2400 Baud modems will usually run at either 1200 or, on a real bad line, 300 Baud. They adapt to the worst-case line conditions and will slow transmission accordingly. Why buy a 2400 Baud modem for a lot more money when it's going to transmit at 1200 Baud most of the time anyway? (Kind of like buying a sports car then always running at lower speed).

You will also notice a few very cheap 1200s on the market at "too good to be true prices". They are. The reason is that they are either not truly Hayes and/or Commodore 1670 compatible therefore not usable in all situations and with all services. The Aprotek Minimodem-C™ is both Hayes and Commodore 1670 compatible and 1200 baud. Why not get a modem that will satisfy your present AND future needs by going directly to an inexpensive Aprotek Minimodem-C™ especially when we have it on sale?

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COMMODORE CLINIC

Is there an expansion cartridge for GEOS 128? Where can you get the discontinued Super Expander graphics cartridge for your C-64? RUN*'s new Clinic columnist has the answers.*

By LOU WALLACE

SOFTWARE

Q *Will the new 1581 drive work with a fast-load cartridge on my C-64?*

—MICHAEL DIPAOLA
WESTWOOD, NJ

A Not at this time. Fast-loaders (software or hardware) make extensive use of the ROM routines built into the 1541 and 1571 drives. That's why some of the so-called "compatible" disk drives don't work properly with all software. The 1581 has a new ROM, very different from the 1541 and 1571, and uses a different disk format, so it's incompatible with the current fast-load packages. However, if enough 1581s are sold, companies like Epyx or Access Software (who produce fast-load cartridges for the 1541) will very likely make one for the 1581.

Q *I've looked far and wide for a copy of the Super Expander graphics cartridge for my C-64, without any luck. Do you know where I can get one?*

—KEN GREEN
GAINESVILLE, FL

A The Super Expander cartridge, which gave the C-64 a set of excellent bit-map and sprite graphics commands, is no longer produced by Commodore. However, on the day your letter arrived, another letter came from Malcolm Kroeber, a Super Expander enthusiast, who reports that the Super Expander is available from Tenex Computer Express (PO Box 6578, South Bend, IN 46660; 800-348-2778) for only $7.95! I called the mail order firm and was told they do indeed have the Super Expander for $7.95 and have plenty in stock.

Q *I just began using RUN Script 128, version 2.56, from your Productivity Pak III. I followed the sequence for saving a file to disk (i.e., I pressed F1, followed by s for save). When the Filename prompt appeared, I entered "LETTER" with the double-quotation marks. Now the filename appears on my disk directory as ""LETTER. Note the twin set of quotes in front of the filename. Needless to say, I can't load the file. Help!*

—BOB CARROLL
THEODORE, AL

A Having made the same mistake myself, I know it's very easy to fix, regardless of the version of RUN Script you use. Boot RUN Script, press F1, followed by an l to load the file. When prompted for the filename, enter ?LETTER, and the file will load perfectly. Scratch the old file with ?LETTER for the filename, and resave the new one.

HARDWARE

Q *My disk drive is failing the 1541 Demo Disk performance test. I can load from the drive, but I can't save anything. The drive passes the Demo Disk's mechanical test, but when I load a program, the computer sometimes locks up, and, worst of all, it keeps corrupting my disks. What's happening?*

—RONALD FORTUNE
SAN LEANDRO, CA

A Stop using your disk drive! You'll just corrupt more of your disks. It sounds like your drive's out of alignment and may even be suffering from chip failure. Take it to your local Commodore service center immediately. There's one called PET VET that's about five miles from you, at 4043 Rhoda Ave., in Oakland; their phone number is 415-530-8119.

Q *Does it matter which serial port of my 1541 I connect my 64 to?*

—JASON OEHRLI
HIGHLAND, CA

A You can use either port. The reason there are two serial ports is to "daisy chain" a printer or multiple disk drives.

Q *When the C-128 came out over a year ago, I thought that besides being able to use my C-64 games and programs on it, I could also take advantage of its 80 columns for word processing and its superior graphics to play better games. I'm having no problems using my 128 word processor, but I am having trouble with games.*

For example, while the 64 mode may be compatible with C-64 programs, the 1571 disk drive, apparently, is not. Many of my games do not work on the 128 in 64 mode when I use them with the 1571.

Since almost all computer outlet stores won't take back a program package that's been opened, it seems to me that it is up to the software manufacturers to alert the consumer to any quirks.

—SCOTT ANGSTREICH
CHERRY HILL, NJ

A The problem you're having with software loading is related to the problem with returning it to a store once it's been opened—software piracy. In an effort to stop the wanton copying of software (particularly games), manufacturers resort to various copy-protection schemes. Many of these techniques utilize specific areas of memory or specific routines within the 1541. If everything isn't just perfect (such as a printer not connected or a cartridge not plugged in or there's a full moon), the program won't load. Even if the drive is slightly out of alignment, it might not load. So you shouldn't be surprised that some software won't work on the 128 in 64 mode when you use a 1571.

However, there are a couple of tricks you can try to get your 1571 to load 1541-formatted programs. Sometimes the 1571 is still in 1571 mode, which might be the case, for example, if you started out in 128 mode and typed in GO 64. The drive may not have been set to 1541 mode when you entered GO 64. If that's the case, type in

```
OPEN 15,8,15,"U0>M0":CLOSE15
```

to reset the disk drive to single-sided, 1541 mode.

Another trick is to hold down the Commodore key when you power up ►

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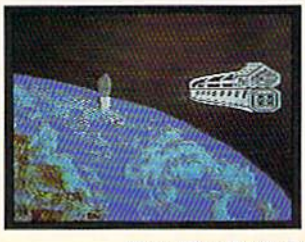

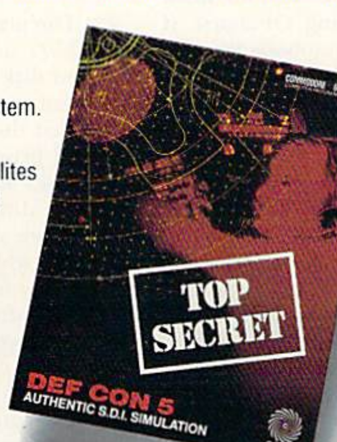

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or reset the computer. That will take you directly to C-64 and 1541 modes.

If you're still experiencing problems, there may be subtle differences between the 1541 and 1571 ROMs. Take the 1571 ROM to a Commodore service center for upgrading. There will be a charge, however, since it is not a free upgrade.

Q *I just bought the new GEOS 128, and already I'm tired of loading and reloading it. I've looked in vain for an expansion cartridge to hold GEOS in both 64 and 128 modes. Is there such a cartridge?*

—BILL SLAUGHTER
ARLINGTON, TX

A Yes. It's Commodore's 1750 512K RAM expansion cartridge. The 1750 works with GEOS 64 (on a 128 in 64 mode) and with GEOS 128 in 128 mode. You can use the cartridge as a 350K RAM disk with GEOS 128 or as a 174K RAM disk with GEOS 64. They make using GEOS much faster and much more productive. Just be sure you save the contents of the RAM disk files to a real disk drive before you turn off the computer, otherwise they'll be lost.

Q *When I insert a program disk into my 1541 disk drive and turn the computer on in 128 mode, the drive light blinks a couple of times and the drive head bangs. What causes this and how can I cure it?*

—GENE ULAT
CORPUS CHRISTI, TX

A What you are observing is the 1541 trying to autoboot a program. I spoke with the experts at Commodore about your problem, and they suggest you turn on your 128 *before* turning on the 1541. Then the computer, realizing that no disk drive is available, will stop trying to autoboot and instead will give you the Ready prompt. You can then turn on the disk drive without head banging or light flashing. Of course, if you do want a disk to autoboot, turn on the drive first, insert the disk and then turn on the C-128.

Q *I have two questions. First, I've seen C-64 software available for SAT preparation. Is there any company that offers C-64-compatible software for preparing for the GRE (Graduate Record Examination)? Second, I'm thinking about getting the Educator 64 for classroom use. However, the ads don't specify what, if any, form of storage device it comes with or uses. Since it appears to be a C-64 in a CBM PET case, I was wondering if it uses a 1541 serial drive, as the C-64 does, or a 2031-style IEEE drive, like the PET?*

—JACK DAVIDSON
WABASH, IN

A I checked with Beth Jala, *RUN*'s Review Editor about GRE preparation software, but she wasn't aware of any for the C-64 or C-128. As for the Educator 64, it's a C-64 in an old style PET case, but it still uses standard 1541 disk drives. Unless the ad explicitly states it includes a drive, you should assume you must buy it separately.

Q *When I turn on my C-64, all I see are strange characters on the screen! I've sought every possible method to solve this problem, but I couldn't. Is my power supply damaged, or what?*

—PATRICK LEUNG
NEW YORK, NY

A There are a number of possibilities, of which the power supply is one. You could try a friend's power supply on your computer, and if it works, you could conclude that, yes, you need a new power supply. But there are other possible problems. You could be experiencing a CPU failure. If that's the case, you'll need a new 6510 microprocessor. Whatever the problem, I strongly suggest you take it to your local CBM service center and let them take a look at it.

Q *I own a C-128 and a 1541. I want to upgrade my drive, as well as buy a new monitor. What are the differences between the 1571 and 1581 drives, and the 1902 and 2002 monitors? I've noticed that the 1581 is less expensive than the 1571, but I'm told it has more storage! Is it completely compatible with 64 and 128 software?*

—MICHAEL GREENSTEIN
ORANGE PARK, FL

A The major difference between the 1571 and 1581 is the greatly increased disk storage capacity (350K vs. 800K) of the 1581. But you should realize that there are not yet many commercial programs available on the 3¼-inch disks accommodated by the 1581. Another difference is the 1581's faster load times. Also, the 1581 can be partitioned, which lets you use subdirectories on your disks.

As for software compatibility, no, the 1581 is not completely compatible. Software with disk-based copy-protection schemes probably won't work. However, unprotected software or software that can use the 1581 as a secondary data drive should work well.

As for the 2002, it is Commodore's "universal" monitor. It has composite, RGBI and RGBA connections, allowing it to work with both the C-64 and the C-128. Commodore is no longer manufacturing the 1902, which is becoming very difficult to get.

The October 1987 issue of *RUN* reviews the C-128D, 1581 drive and the 2002 monitor. Refer to it for additional information.

PROGRAMMING

Q *I'm a 13-year-old programmer and I think your magazine is great! I'm writing a program and I want to know how to keep the listing from prying eyes.*

—BRIAN LEABY
N. BABYLON, NY

A On the C-64, use POKE 775,1 to disable program listing capability. To restore it, use POKE 775,167. On the C-128, use POKE 775,139 to disable and POKE 775,81 to restore.

Q *I accidentally used Save with Replace (SAVE "@0:FILENAME",8) on a C-64 program when I typed it in for the first time, not knowing I shouldn't have. Now I can't get the filename off the disk! Can you tell me how? Also, should I make a backup before scratching the program?*

—NANCYE A. KUSCHE
GLENDALE, AZ

A The easiest way is to simply rename the file. Use this command line in Direct mode:

```
OPEN 15,8,15, "R0:NEWFILENAME =
0:@0:FILENAME":CLOSE 15
```

Now you can scratch the old file without worrying about erasing the program with the filename "Filename". ■

Do you have a problem or question about your Commodore computer system, software or programming? Just send your questions on a postcard to:

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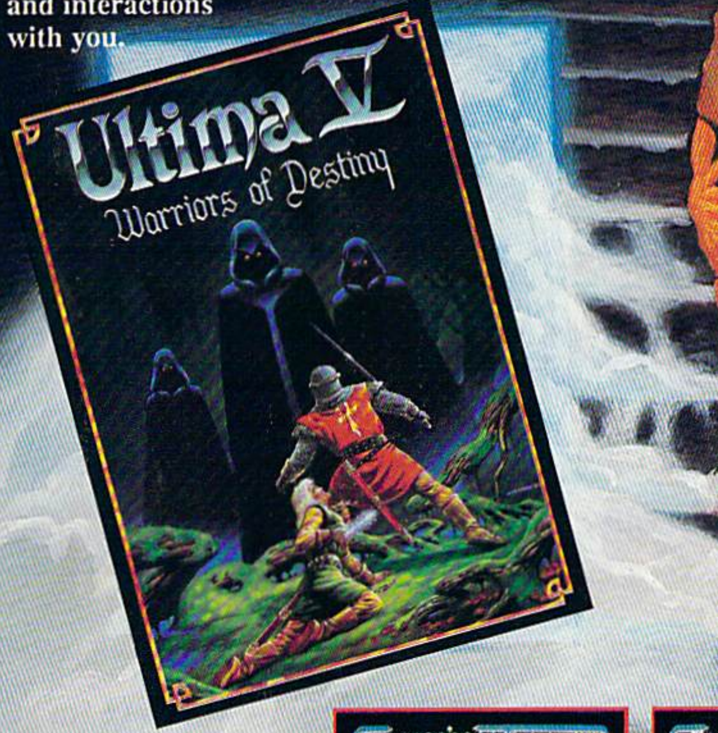

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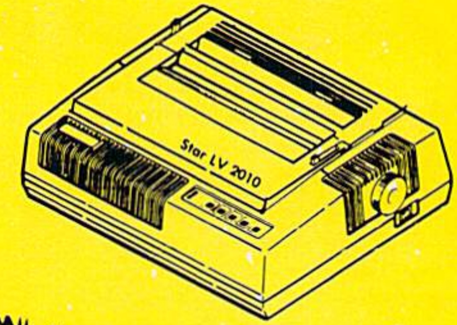

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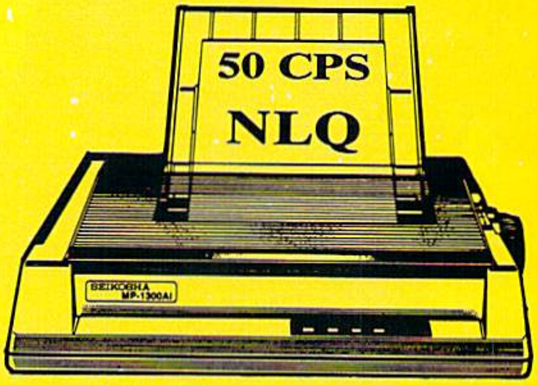

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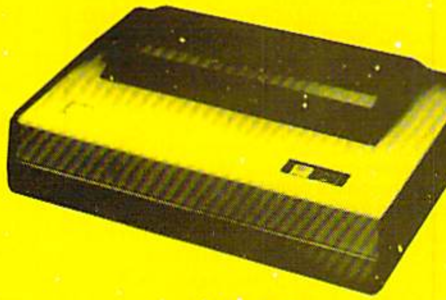

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RUN TERM 128

From p. 54.

Listing 1. RUN Term 128 Boot program.
[Note: Checksums are for *RUN*'s new checksum program.]

```
0 REM RUNTERM BOOT PROGRAM
                      :REM*94
10 BLOAD"TABLES",B0,P(DEC("0E00
   "))                :REM*212
20 BLOAD"PUNTER128"     :REM*1
30 BLOAD"WXMODEM128"  :REM*124
40 BLOAD"RUNTERM128"   :REM*235
45 POKE22003,7:REM PRINTER SECO
   NDARY ADDRESS        :REM*96
46 POKE22004,4:REM PRINTER DEVI
   CE NUMBER           :REM*168
50 BANK0:SYS22000       :REM*81
```

Listing 2. RUN Term 128 main program.

```
10 OPEN 8,8,8,"RUNTERM128,P,W"
                      :REM*167
15 FAST                :REM*86
20 READ A$:IF A$="-1" THEN CLOS
   E8:END             :REM*176
25 IF LEN(A$)<62 THEN 55
                      :REM*232
30 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,29)   :REM*35
35 N=LEN(B$)/2         :REM*38
40 FOR I=1 TO N        :REM*20
45 H$=MID$(B$,I*2-1,2):H=DEC(H$
   )                  :REM*222
50 PRINT#8,CHR$(H);:NEXT:GOTO 2
   0                  :REM*100
55 IF LEN(A$)<20 THEN B$=A$:GOT
   O 70                :REM*65
60 IF LEN(A$)<42 THEN B$=MID$(A
   $,1,20)+MID$(A$,22,(LEN(A$)-
   21)):GOTO 70       :REM*148
65 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,LEN(A$)-42)
                       :REM*80
70 N=LEN(B$)/2         :REM*67
75 FOR I=1 TO N        :REM*73
80 H$=MID$(B$,I*2-1,2):H=DEC(H$
   )                  :REM*251
85 PRINT#8,CHR$(H);:NEXT:GOTO 2
   0                  :REM*129
100 REM RUNTERM 128 DATA
                      :REM*143
101 DATA E2554C00260000000000 0
    000000000004C645607 0423564
    5594559415444     :REM*175
102 DATA 0000000000008F000000 0
    00000FFFF0000001300 0000000
    0000000008541     :REM*149
103 DATA 544450000000004CB15C 4
    8A212AD035620CCCDE8 AD02562
    0CCCD6820CACD     :REM*123
104 DATA A212A9004CCCCDA9028D 0
    0FF20E559A9008D00FF 4C65FA0
    0000048A9008D     :REM*156
105 DATA 00FF6820E255A9028D00 F
    F60A00FB94156996E0A 8810F7A
    00FB954569900     :REM*228
106 DATA 268810F7201E68A9FF8D F
    D12A9008D0056A9288D 0F56A93
    C8D1056A050A9      :REM*211
107 DATA 2099001B8810FAA5D710 0
    DA9508D0F568D0056A9 138D105
    6A90E20D2FFA5       :REM*65
108 DATA F18D0456AD05568D21D0 A
    9FF8D2056A9008D08DC 8D08DD8
    D2F2820605B20     :REM*190
109 DATA 7DFF13139300A90185E5 8
    D2156A90085B0A90485 B120035
    D20183020945D       :REM*71
110 DATA 208C5AA91A85FAA95685 F
    BA90085FCA9FAA20AA0 012065F
    FA91B85FAA956       :REM*81
111 DATA 85FBA90085FCA9FAA209 A
    0042065FF207DFF930D 0D72756
    E5445524D2031      :REM*128
112 DATA 32380D62590D744F4D20 6
    2524F574E0D00207F62 20605B2
    056574C4559A0       :REM*73
113 DATA 27A9C020D2FF88D0F8A9 0
    D4CD2FF207DFF0D0D12 2020202
    020202072756E      :REM*34
114 DATA 7465726D20313238202D 2
    D20636F6D6D616E6473 2020202
    02020200D1268      :REM*16
115 DATA 4F4C4420444F574E2061 6
    C74204B455920574954 4820544
    84520464F4C4C     :REM*210
116 DATA 4F57494E473A0D002047 5
    7207DFF61203D206155 544F444
    9414C20202020     :REM*206
117 DATA 20202020DD2073203D20 7
    3454E44206255464645 520D622
    03D2062554646     :REM*120
118 DATA 455220744F47474C4520 2
    020DD2074203D207449 4D45207
    345540D63203D       :REM*22
119 DATA 20634F4E464552454E43 4
    5207445524D20DD2075 203D207
    5504C4F41440D     :REM*228
120 DATA 64203D20644F574E4C4F 4
    1442020202020202020 DD20762
    03D2076494557       :REM*10
121 DATA 206255464645520D0020 7
    DFF65203D206543484F 2028645
    5504C45582920        :REM*0
122 DATA 2020DD2077203D206255 4
    646455220775241500D 66203D2
    066494C452072       :REM*31
123 DATA 45414445522020202020 D
    D207A203D207A45524F 2062554
    64645520D6820     :REM*116
124 DATA 3D206F4E2F6F46462068 4
    F4F4B2020202020DD20 40203D2
    06449534B2063      :REM*197
125 DATA 4F4D4D414E440D6B203D 2
    066554E4354494F4E20 6B45595
    3202020DD202A       :REM*29
126 DATA 203D2064454641554C54 5
    30D6C203D206C4F4144 2062554
    6464552202020     :REM*161
127 DATA 2020DD205E203D206241 5
    54420724154450D0020 4757207
    DFF6275666665     :REM*236
```

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128 DATA 7220706F696E7465723A 2
    000A5B138E904A6B020 328E207
    DFF2028656E64          :REM*173
129 DATA 3D3630313630290D0020 4
    757A5EB8D0756A5EC8D 0856A90
    08D1F5660EAAD          :REM*160
130 DATA 0056F00320C45920605B 2
    05E5C20D459C91BD001 60C985D
    0036CF755A215          :REM*149
131 DATA DD8159F009CA10F86CF9 5
    54C4559A95948A94448 BD97594
    8BDAD59486041          :REM*220
132 DATA 4243444546484B4C5354 5
    5575A402A5E56313233 4A656F7
    86E6F616F5D5F          :REM*15
133 DATA 5F626D6F5D776F6F5B6A 6
    A6A750306294C1E4585 B50AC27
    EA612489DAA2A          :REM*146
134 DATA CF7FA8AEF56048AE11D0 2
    96F8D11D0A9018D30D0 686048A
    9008D30D0AD11          :REM*83
135 DATA D009108D11D0686000A2 2
    0AD01DD2910D002A203 8E401BA
    DE459F025A900          :REM*211
136 DATA 8DE459AD0056D01AA00F B
    9401B09809918048810 F5A017B
    9001B09809900          :REM*25
137 DATA 048810F560A9018DE459 A
    D0BDCAA290F1869308D 441B8A1
    004A2101002A2          :REM*12
138 DATA 018E4E1BA2202910F002 A
    2318E431BAD0ADCAA29 0F69308
    D471B8A4A4A4A          :REM*144
139 DATA 4A1869308D461BAD09DC A
    A290F69308D4A1B8A4A 4A4A4A1
    869308D491BAD          :REM*235
140 DATA 08DC69308D4C1BA93A8D 4
    51B8D481BA92E8D4B1B A90D8D4
    F1B6078A96E8D          :REM*132
141 DATA 1403A90A8D1503586078 A
    9658D1403A9FA8D1503 5860AD0
    056D00160A04F          :REM*34
142 DATA A9008D0356B9001B0980 8
    C0256202656A9088D03 56AD045
    62026568810E2          :REM*143
143 DATA 60303330300031323030 0
    0A028A920098099001B 8810FAA
    003AD1456D00B          :REM*135
144 DATA B9CD5A99001B8810F730 0
    9B9D25A99001B8810F7 A220AD1
    356F002A2028E          :REM*191
145 DATA 061BA220AD1656F002A2 0
    58E081BA220AD1556F0 02A2178
    E0A1BA220AD0A          :REM*217
146 DATA 0FF002A20A8E0C1BA220 A
    D07281002A2148E0E1B A220AD0
    9281002A2048E          :REM*151
147 DATA 0F1BA220AD2F283002A2 1
    38E101BA220AD2256F0 02A2128
    E121B6000A900          :REM*63
148 DATA 8D5F5BA90185E5A9168D 1
    8D08D2C0AA9048D3B0A A214A90
    820CCCDA20CA9          :REM*213
149 DATA 0020CCCDA20EA90020CC C
    DA9088D2F0AA9008D2E 0A60A90
    18D5F5BA90085          :REM*157
150 DATA E5A93C8D3B0AA9188D2F 0
    AA9108D2E0AA99320D2 FFA9F68
    D2C0A8D18D0A2          :REM*206
151 DATA 14A91820CCCDA20CA910 2
    0CCCDA20EA9104CCCCD 20965BA
    D0056F00320C4          :REM*14
152 DATA 5920507920895DC911D0 0
    620597A4CDE5BC991D0 0620797
    A4CDE5BC913D0          :REM*159
153 DATA 0620035D4CDE5BC92BD0 0
    CEE4F79AD4F79C9EF90 CEF0EAC
    92DD00DCE4F79          :REM*85
154 DATA AD4F79C904B0BE4CF95B 2
    0D45960CE5D5CAD5D5C D008A90
    48D5D5C4CD75A          :REM*16
155 DATA C901D0034CA65AC902D0 0
    6AD215685E560AD0456 85F1604
    8A9A220D2FFA9          :REM*78
156 DATA 9D20D2FF686048A920D0 F
    104A9048D5D5CAE1F56 F00DA20
    08E1F56A99320          :REM*172
157 DATA D2FF4C895CAE075686EB 8
    6E8AE085686EC86E920 5CC1205
    7CD20245C20B7          :REM*95
158 DATA FF2908D029A20520C6FF 2
    0E4FF297FAABD000FF0 E9AE135
    6F00A4820105D          :REM*221
159 DATA 68486CF5556820D2FFA9 0
    085F44C895C20CCFF20 4B5C20E
    4FF20585CF0BF          :REM*78
160 DATA A6D3E008D00BA6EB8E07 5
    6A6EC8E085660C985D0 0620565
    74C895CAE1656          :REM*148
161 DATA F0054820D2FF68AABD00 0
    E48A20520C9FF6820D2 FF20CCF
    F4C895CA9048D          :REM*247
162 DATA 4F79A9008D4E794C5079 A
    2B08EB902A201A00020 77FFE6B
    0D01FE6B1A6B1          :REM*213
163 DATA E0EF9017AE1556D013A2 E
    E86B1A2FF86B0A2008E 13564CD
    75A86B160A204          :REM*73
164 DATA 86B1A20086B060EAA900 8
    D1556A9018D1356A904 85B1A90
    085B0A90D2010          :REM*112
165 DATA 5DAD1356D0F6A90485B1 A
    90085B060207DFF0D0D 614E592
    04B455920544F          :REM*163
166 DATA 20434F4E54494E55450D 0
    020CCFF20E4FFF0FB60 0800A90
    2A292A05D20BD          :REM*80
167 DATA FFA2002068FFA905A202 A
    00020BAFF20C0FFA900 8D14564
    C616F20965B20          :REM*54
168 DATA 7DFF930D0D0D66554E43 5
    4494F4E206B4559533A 0D0D3C2
    073203E415645          :REM*170
169 DATA 20203C206C203E4F4144 0
    D0020895DC953D0034C 475EC94
    CF00160207DFF          :REM*54
170 DATA 0D0D6C4F414420662D6B 4
    559530D0020095E6020 9A5EF0E
    4A900AA2068FF          :REM*254
171 DATA AD6A76A200A01D20BDFF A
    900A208A0FF20BAFFA9 0020D5F
    F90C4207DFF0D          :REM*138
172 DATA 0D6C4F4144206552524F 5
    2210D0020CCFF206F5D 60207DF
    F0D0D73415645          :REM*211
173 DATA 20662D6B4559530D00A9 0
    08D685EA0118C695E88 206A5E6
    00000858C848D          :REM*147
174 DATA 209A5EF026A900AA2068 F
    FAD6A76A200A01D20BD FFA900A
    208A00020BAFF          :REM*124
175 DATA A98CAE685EAC695E20D8 F
    FB09560207DFF0D0D65 4E54455
    22066494C454E          :REM*72
176 DATA 414D453A2000A9108D69 7
    6206B76602C532C5200 8DBA5E8
    CBC5EA000AE6A          :REM*18
177 DATA 76B9B95EF0079D001DC8 E
    8D0F4A9009D001D8E6A 7660A90
    08D1556A9018D          :REM*3
178 DATA 1356A20820C6FF20E4FF 4
    8A590D00F6820105DAD 1356D0E
    FA9008D135660          :REM*24
179 DATA 68A9008D13566020965B 2
    07DFF0D0D615050454E 4420736
    5712046494C45          :REM*93
180 DATA 20544F20625546464552 0
    D0D00209A5ED00160A9 53A0522
    0BE5EA900AA20          :REM*48
181 DATA 68FFAD6A76A200A01D20 B
    DFFA908AAA820BAFF20 C0FF901
    EA90820C3FF20          :REM*169
182 DATA 7DFF0D0D6C4F41442065 5
    2524F52210D0020CCFF 206F5D6
    020DE5EA90820          :REM*177
183 DATA C3FF60000020C459A900 8
    5FAA90485FBAE126120 C9FFA00
    0A5D3D0272052          :REM*158
184 DATA 7A2C13611004AABD000E 2
    0D2FFA590D014E6FAD0 02E6FBA
    5FBCD805F90DA          :REM*88
185 DATA A5FACD7F5F90D320D459 6
    020965BA9088D12618D 1361207
    DFF0D0D734156          :REM*199
186 DATA 45206255464645520D0D 7
    36176653A203C313E3D 744F206
    2554646455220          :REM*218
187 DATA 654E440D202020202020 3
    C323E3D744F20775249 5445207
    04F494E544552          :REM*112
188 DATA 0D0D0020895DC931F005 C
    932F00E60A9EF8D805F A9008D7
    F5F4C3860A5B1          :REM*173
189 DATA 8D805FA5B08D7F5F207D F
    F0D0D73454E4420744F 3A0D3C2
    031203E203D20          :REM*5
190 DATA 7052494E5445520D3C20 3
    2203E203D206D4F4445 4D0D3C2
    033203E203D20          :REM*228
191 DATA 6449534B0D0020895DC9 3
    1D00D206162B0032081 5FA9044
    CC3FFC932D00D          :REM*103
192 DATA A9058D1261A9FF8D1361 4
    C815F209A5EF084A953 A05720B
    E5EA900AA2068          :REM*170
193 DATA FFAD6A76A200A01D20BD F
    FA908AAA820BAFF20C0 FF901EA
    90820C3FF207D          :REM*200
194 DATA FF0D0D73415645206552 5
    24F52210D0020CCFF20 6F5D602
    0815FA9084CC3          :REM*65
195 DATA FFA20820C6FF20E4FF48 A
    5908D136120CCFF6820 146120E
    1FFF005AD1361          :REM*133
196 DATA F0E120CCFFA90820C3FF A
    90420C3FF60000048AE 1261D00
    4684CD2FFE004          :REM*90►
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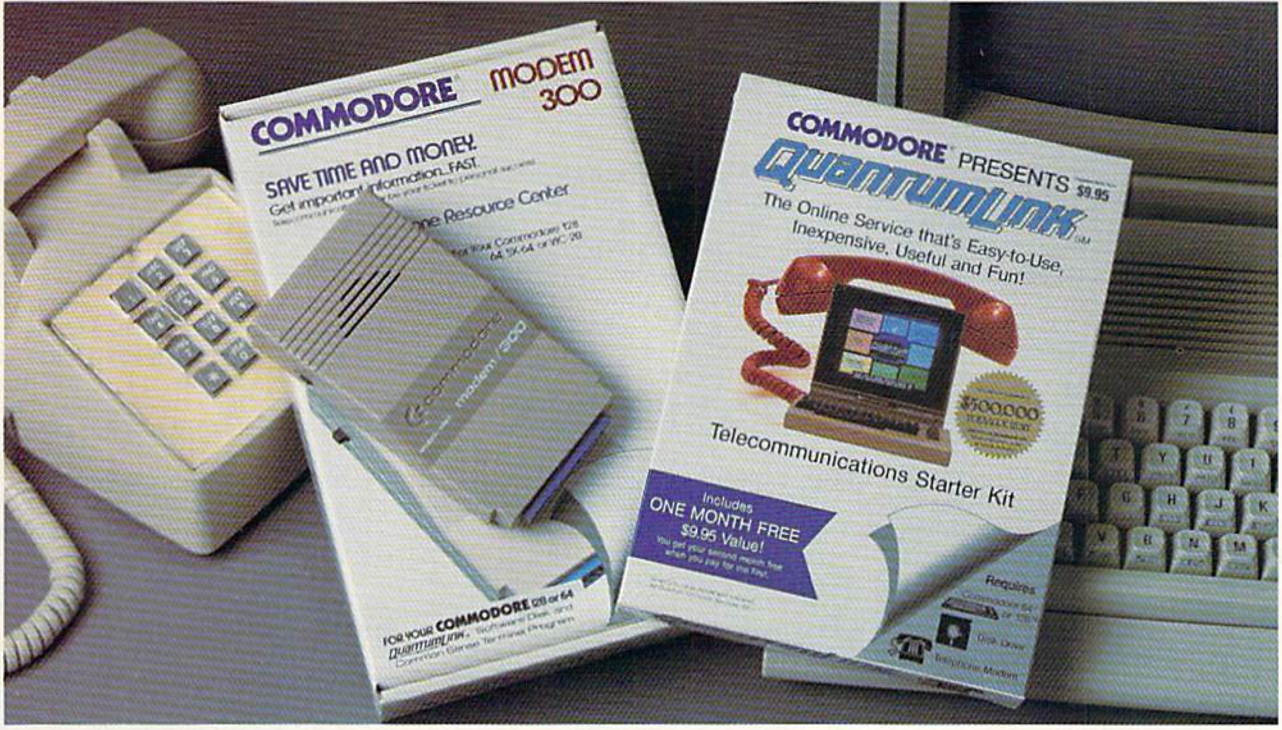
197 DATA D00F20C9FF684820D2FF 2
    0CCFF684CD2FFA20520 C9FF684
    8AABD000E20D2          :REM*47
198 DATA FF20CCFF684CD2FF2096 5
    B207DFF930D0D0D7245 4144207
    365712066494C          :REM*80
199 DATA 4520544F3A0D0D3C2031 2
    03E203D207343524545 4E0D0D3
    C2032203E203D         :REM*148
200 DATA 207052494E544552 0D0D 3
    C2033203E203D206D4F 44454D0
    D0D0020895DC9         :REM*167
201 DATA 31D0034CAA61C932D003 4
    CB261C933F01160A900 8D12614
    CBF6120616290         :REM*251
202 DATA 084C4662A9058D126120 7
    DFF0D0D755345203C6E 6F20736
    3726F6C6C3E20          :REM*98
203 DATA 544F20504155534 50D41 4
    E44203C73746F703E20 544F204
    1424F52542052          :REM*10
204 DATA 454144 0D00209A5ED001 6
    0A953A05220BE5EA900 AA2068F
    FAD6A76A200A0         :REM*166
205 DATA 1D20BDFFA908AAA820BA F
    F20C0FFB0034CE560A9 0820C3F
    FA90420C3FF20         :REM*133
206 DATA 7DFF0D0D6C4F41442065 5
    2524F52210D0020CCFF 206F5D6
    020CCFF207DFF         :REM*251
207 DATA 0D0D70524 94E54455220 6
    552524F52210D004C23 62A9048
    D1261AEF455AC         :REM*222
208 DATA F35520BAFFA9002068FF A
    90020BDFF4CC0FF0000 0020965
    B207DFF930D0D         :REM*219
209 DATA 0D3C2061203E4D204F52 2
    03C2070203E4D3F0D0D 0020895
    DA200C941F011         :REM*147
210 DATA A280C950F00BA203A900 9
    D08DCCA10FA608E7D62 207DFF0
    D0D7748415420         :REM*194
211 DATA 49532054484520684F55 5
    23F202831 2D3132293A 200020C
    CFF201D63AD7C          :REM*65
212 DATA 620D7D628D0BDC207DFF 0
    D0D77484154204953 20 5448452
    06D494E555445         :REM*179
213 DATA 3F2028302D3539293A20 0
    0201D63AD7C628D0ADC A9008D0
    9DC8D08DC60A9         :REM*137
214 DATA 028D6976206B76F037E0 0
    2F00BAD001D8D011DA9 308D001
    DAD001D205063         :REM*105
215 DATA 0A0A0A8D7C62AD011D 2
    05063 0D7C628D7C6260 C930900
    8C93AB00438E9         :REM*163
216 DATA 3060686868686000000 0
    0000000AD09DCCD09DC F0FBCAD
    0F560A8AD6163          :REM*23
217 DATA 8D01DD209563AD62638D 0
    1DD20A06388D0EBA900 85A2A5A
    2C92890FA60A9         :REM*253
218 DATA 0085A2A5A2C90390FA60 A
    90085A2A5A2C902D0FA 60AD636
    3F0034C7164EE           :REM*6
219 DATA 6763A9008D6563AD6263 8
    D01DDA90085A2A5A2C9 6490FAA
    000B9001DF024          :REM*31
220 DATA C92AD00620 5B644CEE63 C
    9309 00EC93AB00A38E9 30D002A
    90A207463EE65          :REM*29
221 DATA 63AC6563D0D7203864AC 6
    663AD01DD2910F004A5 D3F0016
    0205B6488D0EE          :REM*95
222 DATA 202464AD61638D01DDA9 0
    085A2A5A2C9B490FA4C B363207
    DFF0D72454449          :REM*87
223 DATA 414C494E472E2E2E2020 0
    0602 07DFF0D6E554D42 4552204
    F462054524945         :REM*233
224 DATA 533A2000A900AE676320 3
    28EA90D4CD2FFA90085 A2A5A2C
    93C90FA60A900         :REM*124
225 DATA 85A2A5A2C91490FA60EE 6
    76320CCFFA20520C9FF A94120D
    2FF206664A954         :REM*144
226 DATA 20D2FF206664A90D20D2 F
    FA90085A2A5A2C95A90 FAA000B
    9FB55F00920D2           :REM*0
227 DATA FF206664C8D0F2A000B9 0
    01DF00920D2FF206664 C8D0F2A
    90D20D2FFA900         :REM*187
228 DATA 85A2A5A2C95A90FA20CC F
    F203864AC6663AD01DD 2910F00
    4A5D3F001602 0        :REM*217
229 DATA 5B6488D0EEA20520C9FF A
    94120D2FFA90D20D2FF A90085A
    2A5A2C9B490FA         :REM*236
230 DATA 2024644C71642 0965B20 7
    DFF930D0D0D72756E74 65726D2
    D31323820 6175         :REM*73
231 DATA 746F6469616C65720D2D 2
    D2D2D2D2D2D2D2D2D2D 2D2D2D2
    D2D2D2D2D2D2D         :REM*129
232 DATA 2D0D0D0D73656C656374 3
    A0D3C2031203E203D20 3136353
    0206449414C45          :REM*22
233 DATA 520D3C2032203E203D20 3
    13636302064494 14C45 520D3C2
    0332 03E203D20         :REM*121
234 DATA 3136373 02F6841594553 2
    06449414C45520D0020 895DC93
    1F009C932F025         :REM*235
235 DATA C933F0416020 7DFF0D31 3
    63530206D4F44454D0D 00A9208
    D6263A9008D61         :REM*214
236 DATA 638D63634C0166207DFF 0
    D3136363 0206D4F4445 4D0D00A
    9208D6163A900          :REM*74
237 DATA 8D62638D63634C016620 7
    DFF0D31363730 2F6841 5945532
    06D4F44454D0D         :REM*185
238 DATA 00A9208D6263A9008D61 6
    3A9018D63634C1666A9 208D03D
    DAD61638D01DD          :REM*20
239 DATA A90085A2A5A2C96490FA A
    9008D6763207DFF0D0D 656E746
    5722072656469          :REM*74
240 DATA 616C20646 56C61792028 4
    3522 03D2032302 05345 4353293
    A2000A0148C66           :REM*0
241 DATA 63A9028D6976206B76F0 0
    6206E728C6663207DFF 0D0D617
    5746F6469616C         :REM*185
242 DATA 6572206D656E750D0D73 6
    56C6563743A0D3C2031 203E203
    D20654E544552         :REM*217
243 DATA 206E554D4245522 0544F 2
    06449414C0D3C203220 3E203D2
    06449414C2066         :REM*166
244 DATA 524F4D2070484F4E4520 6
    24F4F4B0D3C2033203E 203D206
    C4F4144204120         :REM*209
245 DATA 70484F4E4520624F4F4B 0
    D3C2034203E203D2073 4156452
    0412070484F4E          :REM*80
246 DATA 4520624F4F4B0D3C2035 2
    03E203D2065444954 20 4120704
    84F4E4520624F          :REM*23
247 DATA 4F4B0D0D0020895DC931 9
    010C936B00C38E931AA BD19674
    8BD1E67486067         :REM*217
248 DATA 686A6868224B1CB2E920 7
    DFF0D0D0D654E544552 2023205
    44F2044494 14C         :REM*166
249 DATA 3A2000A91E8D6976206B 7
    6F034207DFF0D0D6449 414C494
    E472E2E2E0D0D          :REM*50
250 DATA 684F4C442 0444F574E20 7
    348494654204B455920 544F204
    1424F5254210D         :REM*251
251 DATA 0D0020AB360000000 01F 2
    E3E4EA9008D7A678D7B 67207DF
    F0D0D0D73454C          :REM*35
252 DATA 4543542 06E554D424552 2
    028312D39293A200D00 20895DC
    9319011C93AB0         :REM*135
253 DATA 0D38E931AA8D7B670940 8
    D7A6760A90060A9FF8D 7B67EE7
    B67AD7B67C909         :REM*209
254 DATA F01F48186931 20D2FF20 7
    DFF203D20006809408D 7A6720F
    067A90D20D2FF         :REM*197
255 DATA 4CC66760AD7D67AC7A67 4
    CB56AAD7C67AC7A674C B56AAD7
    E67AC7A674CB5         :REM*127
256 DATA 6AAD7F67AC7A674CB56A A
    D8067AC7A674CB56A60 A9028D0
    0FF60A90085FA         :REM*218
257 DATA A94085FBA900A891FAC8 D
    0FBE6FBA6FBE04AD0F3 A002B94
    868990049881 0           :REM*4
258 DATA F7605446420020 7DFF0D 0
    D0D6449414C2066524F 4D20704
    84F4E45424F4F         :REM*209
259 DATA 4B0D0020476A20C16720 8
    167D0034C0166207DFF 0D0D6E4
    F5720644941 4C         :REM*144
260 DATA 494E473A200020F067A9 0
    D20D2FF201E68A000AD 7A6785F
    BAD7C6785FAB1         :REM*140
261 DATA FAF00699001DC8D0F699 0
    01D201D6820AB363020 7DFF0D0
    D0D7341564520         :REM*143
262 DATA 5448452070484F4E4542 4
    F4F4B0D0020476A201E 68A9008
    D685EA94A8D69         :REM*250
263 DATA 5EA900A040206A5E201D 6
    84C0166207DFF0D0D0D 6544495
    4205448452070         :REM*183
264 DATA 484F4E45424F4F4B0D00 2
    0476A208167D0034C01 66207DF
    F0D0D62627320          :REM*33
265 DATA 6E414D453A200020F067 A
    9108D6976207DFF0D0D 6262732
    06E414D453A20         :REM*213 ►
```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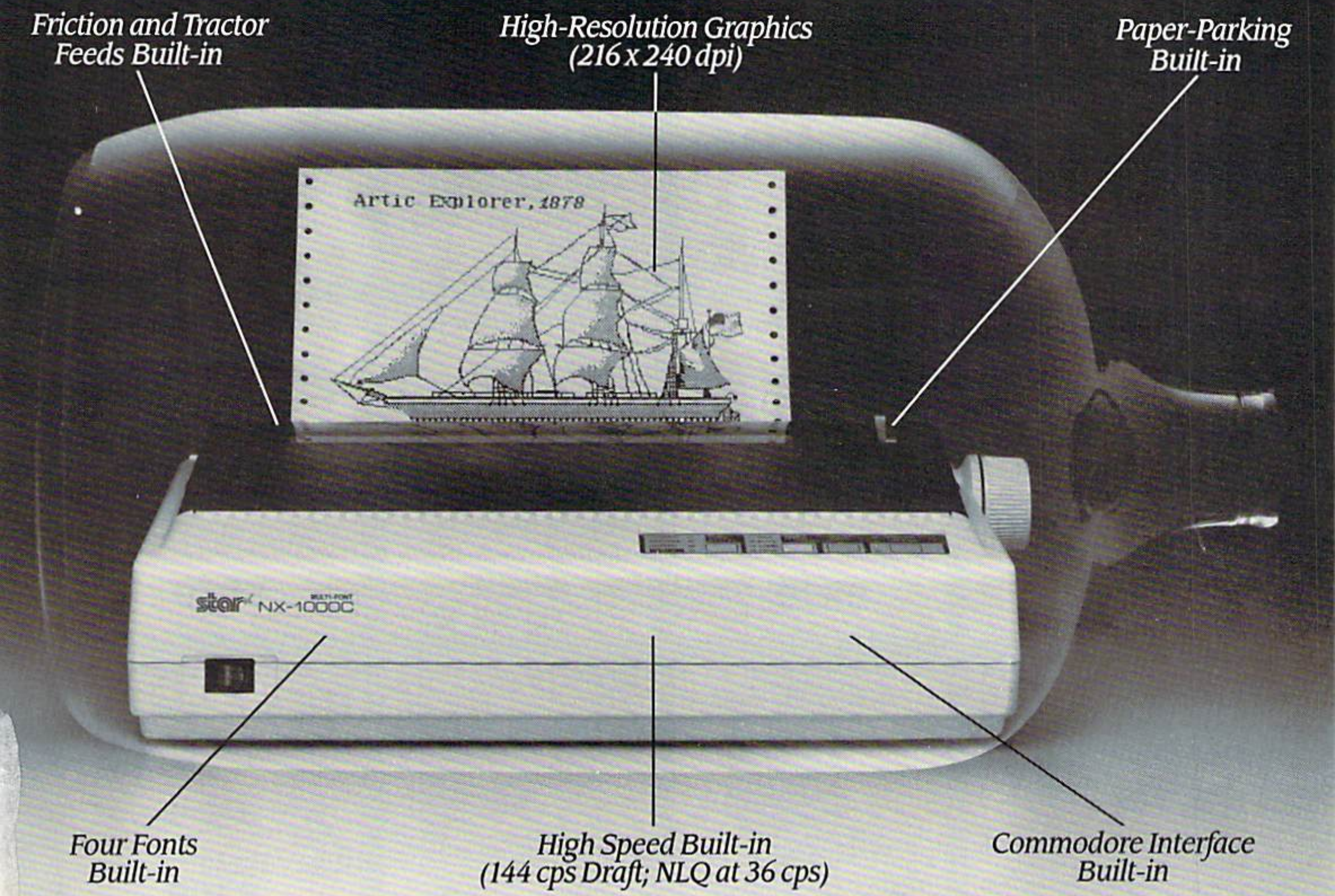
```
266 DATA 00206B76F006AD7D6720 0
    76A207DFF0D70484F4E 4520233
    A200020F967A9        :REM*117
267 DATA 1E8D697620 7DFF0D0D70 4
    84F4E4520233A20002 0 6B76F00
    6AD7C672 0076A       :REM*228
268 DATA 207DFF0D735452494E47 2
    023313A2000200268A9 108D697
    6207DFF0D0D73        :REM*197
269 DATA 5452494E47 2023313A20 0
    0206B76F006AD7E6720 076A207
    DFF0D73545249        :REM*185
270 DATA 4E472023323A200020 0B 6
    8207DFF0D0D73545249 4E47202
    3323A200020 6B          :REM*7
271 DATA 76F006AD7F6720076A20 7
    DFF0D735452494E4720 23333A2
    000201468207D           :REM*6
272 DATA FF0D0D735452494E4720 2
    3333A2000206B76F006 AD80672
    0076A4C016685        :REM*103
273 DATA FAAD7A6785FBA000B900 1
    DF00591FAC8D0F691FA 60207DF
    F0D0D0D6C4F41         :REM*86
274 DATA 44205448452070484F4E 4
    5424F4F4B0D00201E68 A900A04
    020095E201D68        :REM*118
275 DATA 4C0166A202BD0049DD48 6
    8D006CA10F54C7F6A20 7DFF0D0
    D635245415449        :REM*132
276 DATA 4E47206E45572070484F 4
    E45424F4F4B2E2E2E0D 0020246
    868684C01666 0        :REM*39
277 DATA AD7E6785FAAD7A67D001 6
    085FBA20520C9FFA000 B1FAF00
    DAABD000E20D2         :REM*62
278 DATA FF206664C8D0EF20CCFF 6
    0AD7F674C836AAD8067 4C836A8
    4FB85FAA000B1        :REM*208
279 DATA FAF00620D2FFC8D0F660 2
    07DFF070707070 00208C 5A60493
    000A20F20C3FF         :REM*57
280 DATA A902A2D2A06A20BDFFA9 0
    FA208A820BAFF20C0FF 20F26A6
    020CCFFA5BA20          :REM*0
281 DATA B4FFA96F85B92096FF20 A
    5FF8D2F6B20A5FF8D30 6B20A5F
    FC90DD0F920AB         :REM*31
282 DATA FFAD2F6BC930F016207D F
    F0D0D6449534B206552 524F523
    A200000003860          :REM*2
283 DATA 1860000050505350209A 5
    ED00238602 07DFF0D0D 73656C6
    563743A203C70        :REM*148
284 DATA 3E524F4752414D203C73 3
    E455155454E5449414C 0D00208
    95D4820D2FFA9        :REM*173
285 DATA 0D20D2FF68C953D00AA2 0
    28E366B8E376B18 60A9 50A2008
    E366BE88E376B        :REM*212
286 DATA 186020D56A207DFF0D0D 0
    D70554E5445552207550 4C4F414
    4210D00203C6B         :REM*59
287 DATA 9008A90F20C3FF4CC66A A
    D6A76A200A01D20BDFF A200206
    8FFA902A208AC        :REM*243
288 DATA 366B20BAFF20C0FF9010 2
    0F26AA90220C3FFA90F 20C3FF4
    CC66A20F26AB0        :REM*202
289 DATA EE201530AD376B8D1B38 2
    00C30AD0002C901F0DB 201530A
    D20568D183820         :REM*57
290 DATA 06304CD76B20D56A207D F
    F0D0D0D70554E544552 20644F5
    74E4C4F414421        :REM*250
291 DATA 0D00203C6B9008A90F20 C
    3FF4CC66A2015302009 30AD000
    2C901F02BAD1B         :REM*89
292 DATA 38AABD386BA05720BE5E A
    D6A76A200A01D20BDFF A200206
    8FFA902A208A8         :REM*95
293 DATA 20BAFF20C0FF901020F2 6
    AA90220C3FFA90F20C3 FF4CC66
    A20F26AB0EEA2        :REM*241
294 DATA 01206863 20C2E6201530 2
    00330A2012068634C6B 6C207DF
    F931111111111        :REM*171
295 DATA 11111111111111111111 1
    111111111745241 4E53 4645523
    A2000A900A01D        :REM*166
296 DATA 20E255A90D4CD2FF20BE 5
    EAD6A76A200A01D20BD FFA2002
    068FFA908AAA8        :REM*169
297 DATA 20BAFF4CC0FFA9168D18 D
    08D2C0AA9048D3B0AA9 018D1F5
    660A9F68D18D0         :REM*56
298 DATA 8D2C0AA93C8D3B0A6020 D
    56A207DFF0D0D0D784D 4F44454
    D207550 4C4F41         :REM*52
299 DATA 44210D00203C6B9008A9 0
    F20C3FF4CC66AA05220 C26C901
    020F26AA90820        :REM*229
300 DATA C3FFA90F20C3FF4CC66A 2
    0F26AB0EE20DE6C2093 6C20032
    820F16C4C2F6D        :REM*104
301 DATA 20D56A207DFF0D0D0D78 4
    D4F44454D20644F574E 4C4F414
    4210D00203C6B        :REM*127
302 DATA 9008A90F20C3FF4CC66A A
    05720C26C901020F26A A90820C
    3FFA90F20C3FF        :REM*142
303 DATA 4CC66A20F26AB0EE20DE 6
    C20936C2000 2820F16C 4C826D0
    01543572 0995A          :REM*9
304 DATA 20965B207DFF930D0D0D 7
    5504C4F4144204120 46 494C452
    0746F20534F4D         :REM*86
305 DATA 454F4E45210D2D2D2D2D 2
    D2D2D2D2D2D2D2D2D2D 2D2D2D2
    D2D2D2D2D2D2D         :REM*64
306 DATA 2D0D0D73656C6563743A 0
    D3C20312 03E203D2070 554E544
    5520D3C203220        :REM*225
307 DATA 3E203D20784D4F44454D 2
    0634845434B53554D0D 3C20332
    03E203D20784D         :REM*98
308 DATA 4F44454D20637263 0D0D 0
    020895DC931B0034CC6 6AC934B
    0F938E931F00A        :REM*182
309 DATA AABDA36D8D06284CFF6C 4
    C906B20995A20965B20 7DFF930
    D0D0D644F574E         :REM*72
310 DATA 4C4F4144204120 46494C 4
    5206672 6F6D20534F4D 454F4E4
    5210D2D2D2D2D        :REM*143
311 DATA 2D2D2D2D2D2D2D2D2D2D 2
    D2D2D2D2D2D2D2D2D2D 2D0D0D7
    3656C6563743A        :REM*197
312 DATA 0D3C20312 03E203D2070 5
    54E5445520D3C203220 3E203D2
    0784D4F44454D        :REM*239
313 DATA 20634845434B53554D0D 3
    C2033203E203D20784D 4F44454
    D20637263 0D3C        :REM*194
314 DATA 20342 03E203D2077784D 4
    F44454D0D0D0020895D C931B00
    34CC66AC935B0         :REM*68
315 DATA F938E931F00AAABDA36D 8
    D06284C506D4C0B6CA2 01AD135
    6F001CA8E1356         :REM*24
316 DATA 60A201AD1556F001CA8E 1
    55660A201AD1656F001 CA8E165
    660A201AD1456        :REM*249
317 DATA F001CA8E145620 3A6F60 8
    AF024A9088D100AA954 8D003BA
    9038D013BA937        :REM*189
318 DATA 8D160AA9038D170AA946 8
    D120AA9018D130A60A9 068D100
    AA9518D003BA9        :REM*250
319 DATA 0D8D013BA9518D160AA9 0
    D8D170AA9448D120AA9 068D130
    A6000AD856FD0         :REM*50
320 DATA 10A9018D856FA9208D01 D
    DA9008D03DD60A9008D 856FA90
    08D01DDA9208D         :REM*38
321 DATA 03DD6020965B207DFF93 0
    D0D0D72756E7465726D 2D31323
    8206465666175        :REM*193
322 DATA 6C74733A0D2D2D2D2D2D 2
    D2D2D2D2D2D2D2D2D2D 2D2D2D2
    D2D2D0D0D3C20        :REM*161
323 DATA 31203E203D2073455420 6
    34F4C4F52530D3C2032 203E203
    D2070554E5445        :REM*240
324 DATA 5220624C4F434B53495A 4
    50D3C203320 3E203D20 784D4F4
    4454D20745241        :REM*136
325 DATA 4E534C4154450D3C2034 2
    03E203D20784D4F4445 4D20646
    C65207343 5245        :REM*252
326 DATA 454E0D3C2035203E203D 2
    0784D4F44454D207041 4420735
    452495050494E        :REM*135
327 DATA 470D3C2036203E203D20 6
    348414E4745207 04152 4954590
    D3C2037203E20        :REM*251
328 DATA 3D206348414E47452077 4
    F5244206C454E475448 0D3C203
    8203E203D2063         :REM*28
329 DATA 48414E4745207 3544F50 2
    06249545 30D3C203920 3E203D2
    06C494E454645        :REM*114
330 DATA 4544532 06F4E202F206F 4
    6460D3C2030203E203D 2064454
    C45544520 6B45         :REM*42
331 DATA 5920764 14C55450D0D00 2
    0895DC930901 0C93AB0 0C38E93
    0AABDF67048BD        :REM*201
332 DATA 007148607671717273 73 7
    4757575020BFEE74BBC 2E18A2F
    5010020 7DFF93        :REM*121
333 DATA 0D0D0D6368616E676520 7
    3637265656E20636F6C 6F72732
    10D0D70524553        :REM*150
334 DATA 53203C2031203E20544F 2
    043484 14E4745 20666F 7265677
```

Continued on p. 98.

The new Star Multi-Font. How did Star get it all in there?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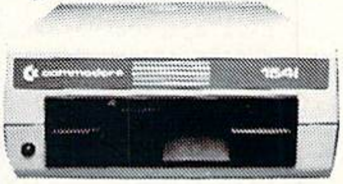

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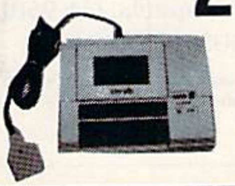

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From p. 94.

```
    26F756E640D41               :REM*28
335 DATA 4E44203C2032203E2054 4
    F204348414E47452062 61636B6
    7726F756E640D               :REM*56
336 DATA 434F4C4F52532E20614E 5
    9204F544845522204B45 5920455
    849545321 0D0D              :REM*26
337 DATA 0020895DC931F005C932 F
    01660EE0A71AE0A71E0 109005A
    2008E0A7120BF              :REM*220
338 DATA 714C0C71EE0B71AE0B71 E
    0109005A2008E0B7120 D1714C0
    C7124D71008A5              :REM*134
339 DATA F129F01DEF71AA86F18E 0
    4566024D71016A91A8D 00D62C0
    0D610FBAD01D6              :REM*234
340 DATA 29F01DEF718D01D6608E 2
    1D060000F08070B0402 0D0A0C0
    906010503 0E20              :REM*69
341 DATA 7DFF930D0D0D6348414E 4
    7452070554E5445522 0 624C4F4
    34B2073495A45              :REM*214
342 DATA 2E0D0D63555252454E54 2
    0624C4F434B2053495A 453A200
    0AE2056A90020                :REM*7
343 DATA 328EA9038D69762 07DFF 0
    D0D654E5445522 04E45 5720734
    95A453A20002 0             :REM*165
344 DATA 6B76F00C206E72C028B0 0
    2A0FF8C205660000000 A91D85F
    BA90085FAA000              :REM*176
345 DATA AE6A76A9008D6D72A900 8
    D6B728D6C728AD0034C E072AC6
    D72B1FAAC6D72              :REM*227
346 DATA B1FAC9303044C93A1040 4
    80E6B722E6C72AD6B72 AC6C720
    E6B722E6C720E              :REM*116
347 DATA 6B722E6C72186D6B728D 6
    B72986D6C728D6C7268 38E9301
    86D6B728D6B72              :REM*111
348 DATA 9003EE6C72EE6D72CAD0 B
    6189001 38AD6C72AC6B 7260207
    DFF0D0D0D6348              :REM*255
349 DATA 414E4745207 84D4F4445 4
    D206445464155 4C5453 3A0D0D6
    1534349492074               :REM*25
350 DATA 52414E534C414544 5204F 4
    E3F2020792F6E0D2864 4546415
    54C5420495320               :REM*39
351 DATA 6E6F207472616E736C61 7
    4696F6E290D0020895D A200C95
    9D002A2808E07              :REM*129
352 DATA 2860207DFF0D0D0D6348 4
    14E474520784D4F4445 4D20644
    54641554C5453              :REM*167
353 DATA 3A0D0D75534520646C65 2
    06D41534B494E472028 464F522
    070632070 5552              :REM*201
354 DATA 53554954293F20792F6E 0
    D28644546 41554C5420 4953206
    E6F20646C6520                :REM*8
355 DATA 6D61736B696E67290D00 2
    0895DA200C959D002A2 808E092
    860207DFF0D0D              :REM*172
356 DATA 0D6348414E474520784D 4
    F44454D2064454641 55 4C54533
    A0D0D73545249              :REM*162
357 DATA 5020654E44204F462066 4
    94C45207041444449 4E 473F207
    92F6E0D286445              :REM*162
358 DATA 4641554C542049532079 6
    5732C207354524950 50 494E472
    04F4E290D0020              :REM*163
359 DATA 895DA200C94ED002A280 8
    E2F28600020 60A0E020 7DFF0D0
    D0D6348414E47              :REM*115
360 DATA 4520704152495459 3A0D 6
    355525245 4E5420 5345 5454494
    E473A2000AD11               :REM*32
361 DATA 0AD00B207DFF6E4F4E45 0
    04CAA74C920D00A207D FF6F444
    4004CAA74C960              :REM*189
362 DATA D00B207DFF6556454E00 4
    CAA74C9A0D00B207DFF 6D41524
    B004CAA74C9E0              :REM*240
363 DATA D00C207DFF7350414345 0 ►
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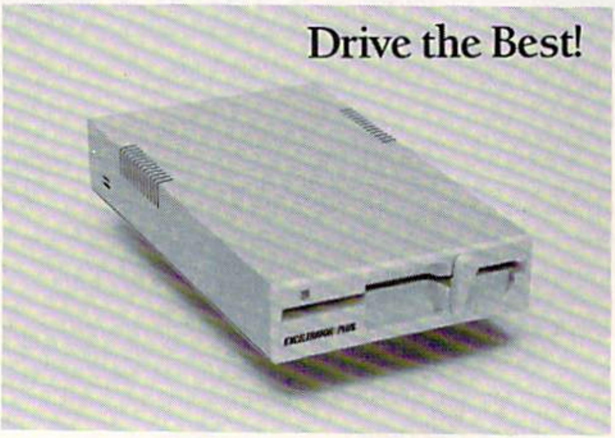

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     04CAA74207DFF3F3F3F 3F00207
     DFF0D73656C65         :REM*236
364 DATA 63743A0D0D3C2030203E 2
     03D206E4F4E450D3C20 31203E2
     03D206F44440D         :REM*146
365 DATA 3C2032203E203D206556 4
     54E0D3C2033203E203D 206D415
     24B0D3C203420         :REM*202
366 DATA 3E203D2073504143450D 0
     D0020895DC930900EC9 35B00A3
     8E930AABD2A74         :REM*196
367 DATA 8D110A60000000000060 4
     02000AD100AA2052960 DD1075F
     005E8E00990F6          :REM*37
368 DATA 8E1856207DFF0D0D0D63 4
     8414E474520774F5244 206C454
     E4754483A0D0D         :REM*210
369 DATA 63555252454E54206C45 4
     E4754483A2000AE1856 A900203
     28E207DFF0D6E         :REM*113
370 DATA 554D424552204F462064 6
     1746120424954532028 352D382
     93A200D002089         :REM*249
371 DATA 5DC9359019C939B01538 E
     930AABD10758D1075AD 100A299
     F0D10758D100A          :REM*54
372 DATA 60207DFF0D0D0D634841 4
     E47452073544F502062 4954533
     A0D0D73656C65         :REM*154
373 DATA 6374203C2030203E204F 5
     2203C2031203E207374 6F70206
     269743A0D0020          :REM*29
374 DATA 895DC930D009AD100A09 8
     08D100A60AD100A297F 8D100A6
     0A20AAD0A0FF0         :REM*189
375 DATA 02A2008E0A0F60207DFF 9
     30D0D0D6348414E4745 2064454
     C455445206B45         :REM*233
376 DATA 592056414C55452E0D0D 6
     3555252454E54207641 4C55453
     A2000AE140EA9         :REM*103
377 DATA 0020328EA9038D697620 7
     DFF0D0D654E54455220 4E45572
     076414C55453A           :REM*4
378 DATA 2000206B76F00B206E72 8
     C140EA91499000F6000 00A9008
     D6A7620CCFF20          :REM*98
379 DATA 4B5C20E4FFF0FB20585C C
     90DD00F20D2FFAE6A76 A9009D0
     01DAE6A7660C9         :REM*145
380 DATA 14D00620D3764C7376C9 1
     8D00A20D376AD6A76D0 F8F0CAA
     C6A76CC6976D0         :REM*221
381 DATA 08A90720D2FF4C7376A8 2
     97FC920B0034C737698 AE6A769
     D001D20D2FFEE         :REM*197
382 DATA 6A764C7376AE6A76F00B C
     E6A76A99D20D2FF2058 5C60207
     DFF0D0D644953         :REM*243
383 DATA 4B206449524543544F52 5
     93A0D755345203C6E6F 2073637
     26F6C6C3E2054          :REM*20
384 DATA 4F2050415553452C0D41 4
     E44207368696674206B 6579205
     44F2041424F52         :REM*115
385 DATA 540D0D1200A200A01DAD 6
     A7620BDFFA900A208A0 6020BAF
     F20C0FFB04CA2         :REM*142
386 DATA 0020C6FF20B4B8A00384 6
     3A5D3D03C20CFFF8560 A590D03
     320CFFF8561A5         :REM*174
387 DATA 90D02AC663D0EA2007BA A
     900A208A003205DBAA9 2020D2F
     F20CFFFF009A6         :REM*137
388 DATA 90D00C20D2FF90F220B4 B
     8A002D0BE20CCFFA900 3820C3F
     F206F5D602096         :REM*164
389 DATA 5BA2088660A900856285 B
     7AA2068FF207DFF930D 0D654E5
     4455220644953         :REM*244
390 DATA 4B20634F4D4D414E4420 2
     84F522024293A2000A9 1E8D697
     6206B76AD001D         :REM*212
391 DATA C924D0034CE476A900A2 0
     8A00F20BAFF20C0FFB0 35A2002
     0C9FFB02EA2FF          :REM*49
392 DATA AD001DC940F00BE8BD00 1►
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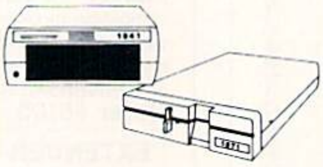

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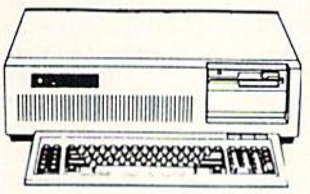

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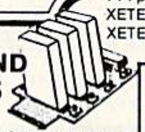

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RUN TERM 128

```
    DF00520D2FF90F520CC FFA2002
    0C6FFB01020CF          :REM*249
393 DATA FF20D2FFC90DF006A590 2
    9BFF0F04C917700A903 85E520D
    C7820EC78AD04           :REM*57
394 DATA 5685F1A90085F420B7FF 2
    908D020A20520C6FF20 E4FF297
    FAABD000FF010          :REM*153
395 DATA AE1356F0054820105D68 2
    0D2FF4C347820E1FFD0 06A9018
    D1F566020CCFF            :REM*5
396 DATA 20E4FFF0BAC90DD00620 A
    E784C2E78C914D0034C 9D78C91
    8F0F2AE29789D          :REM*219
397 DATA 001DE8E050F0E48E2978 4
    C3178AE2978F009CE29 78CAA92
    09D001D4C3178          :REM*116
398 DATA A20520C9FFAE2978F01C A
    000B9001DAABD000E20 D2FFA90
    085A2A5A2C904          :REM*205
399 DATA D0FAC8CC2978D0E6A90D 2
    0D2FF4CCCFFA050A920 99001D8
    810FAA2008E29           :REM*31
400 DATA 7860AD0056F013A000B9 0
    01D20467A0980201779 C8C050D
    0F060A000B900           :REM*34
401 DATA 1D20467A0980992804C8 C
    050D0F06048A212A900 20CCCDE
    89820CCCDA21F          :REM*166
402 DATA 6820CCCDA212A90020CC C
    DA212A90820CCCDE898 20CCCDA
    21FAD045620CC          :REM*242
403 DATA CDA212A9004CCCCD0000 0
    000AD4E79A2018E4C79 85FAAD4
    F7985FBA95085          :REM*171
404 DATA B2AD105685B3A0008E4C 7
    920527AAE4C79C90DD0 09A91F9
    9000BC84C8E79           :REM*36
405 DATA 20467A99000BC8CC0F56 D
    0DE88C884FE88B9000B 91B2881
    0F8A4FE189865          :REM*230
406 DATA FA85FAA5FB6900C9EFD0 0
    2A90485FBE001D0038C 4D79CC0
    F56F008A92091           :REM*95
407 DATA B2C84CB479A92091B218 A
    5B26D0F5685B29002E6 B3E8E01
    6F0034C6879AD           :REM*50
408 DATA 0056D0034C3F7AA910A2 1
    220CCCDE8A90020CCCD A00084B
    2A91385B3A050           :REM*28
409 DATA B1B220CACDC8D0F8E6B3 A
    5B3C919D0F0B1B220CA CDC8C0E
    0D0F6A918A212           :REM*24
410 DATA 20CCCDE8A90020CCCDA9 1
    385B3AD045620CACDC8 D0F7E6B
    3A5B3C919D0EF          :REM*212
411 DATA AD045620CACDC8C0E0D0 F
    5AD4F79AE4E7960 4829 804A85F
    E68293F05FE60          :REM*248
412 DATA A9FAA2014C74FFAD4E79 1
    86D4D798D4E79AD4F79 6900C9E
    FD007A9008D4E          :REM*202
413 DATA 79A9048D4F794C5079AD 4
    E7985FAAD4F7985FB20 A17A20A
    17AB009A00020           :REM*96
414 DATA 527AC90DD0F2A5FA8D4E 7
    9A5FB8D4F794C5079C6 FAA9FFC
    5FAD014C6FBA5          :REM*150
415 DATA FBC904B00AA90485FBA9 0
    085FA386085FB1860      :REM*138
416 DATA -1                 :REM*19
```

Listing 3. RUN Term 128 Punter program.

```
10 OPEN 8,8,8,"PUNTER128,P,W"
                          :REM*168
15 FAST                    :REM*86
20 READ A$:IF A$="-1" THEN CLOS
   E8:END                 :REM*176
25 IF LEN(A$)<62 THEN 55
                          :REM*232
```

Continued on p. 106.

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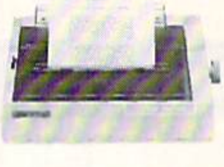

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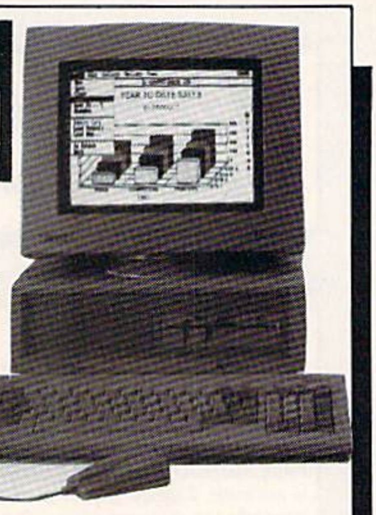

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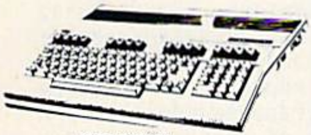

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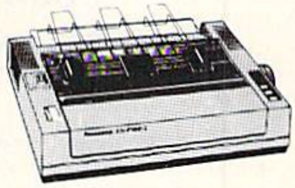

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RUN TERM 128

From p. 102.

```
30 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,29)      :REM*35
35 N=LEN(B$)/2             :REM*38
40 FOR I=1 TO N            :REM*20
45 H$=MID$(B$,I*2-1,2):H=DEC(H$
   )                      :REM*222
50 PRINT#8,CHR$(H);:NEXT:GOTO 2
   0                      :REM*100
55 IF LEN(A$)<20 THEN B$=A$:GOT
   O 70                    :REM*65
60 IF LEN(A$)<42 THEN B$=MID$(A
   $,1,20)+MID$(A$,22,(LEN(A$)-
   21)):GOTO 70           :REM*148
65 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,LEN(A$)-42)
                           :REM*80
70 N=LEN(B$)/2             :REM*67
75 FOR I=1 TO N            :REM*73
80 H$=MID$(B$,I*2-1,2):H=DEC(H$
   )                      :REM*251
85 PRINT#8,CHR$(H);:NEXT:GOTO 2
   0                      :REM*129
100 REM PUNTER PROTOCOL FOR RUN
    TERM128               :REM*182
101 DATA 0030A9002CA9032CA906 2
    CA9092CA90C2CA90FEA 4C1B304
    CA1354C953685          :REM*53
102 DATA 64BA8E1C38A933186564 8
    D3130A93069008D3230 4C39304
    C57304C0E344C          :REM*84
103 DATA D6334CD4344C1D354CB0 3
    54C9536474F4F424144 41434B5
    32F4253594E8D         :REM*230
104 DATA 0538A9008D00388D0138 8
    D0238A9008D06388D07 3820813
    620F830A596D0         :REM*228
105 DATA 58AD01388D0038AD0238 8
    D0138AD00028D0238A9 008D043
    8A9018D0338AD          :REM*60
106 DATA 05382C0338F016AC0438 A
    200BD0038D94830D009 C8E8E00
    3D0F24CC4300E          :REM*78
107 DATA 0338AD0438186903 8D04 3
    8C90FD0D24C6530A9FF 8D06388
    D07384C6D30EE         :REM*199
108 DATA 0638D003EE0738AD0738 0
    D0638F013AD0638C907 AD0738C
    9149082A90185         :REM*187
109 DATA 964C6435A9008596 60EA 9
    848AD180ACD190AF016 AC190AB
    1C848EE190AA9          :REM*22
110 DATA 008596688D000268A84C 2
    331A9028596A9008D00 0268A84
    8A90385BA6860          :REM*31
111 DATA A20520C9FFA200B94830 2
    0D2FFC8E8E003D0F44C CCFF8D0
    838A9008D0B38          :REM*20
112 DATA A9028564AC0838202A31 A
    90420573 0A596F007C6 64D0F34
    C4831A009202A          :REM*92
113 DATA 31AD0D38F005AD0838F0 1
    FAD04398D09388D1738 208532A
    596C901F00CC9         :REM*122
114 DATA 02F0DBC904F004C908F0 D
    360A91020573 0A596D0 C9A90A8
    D0938A00C202A          :REM*24
115 DATA 31A90820573 0A596F005 C
    E0938D0ED60A9018D0B 38AD1E3
    8F005A000202A         :REM*213
116 DATA 31A90B20573 0A596D0ED A
    9008D1E38AD0438C900 D035AD0
    D38D068EE1938          :REM*47
117 DATA D003EE1A38206A33A005 C
    8B166C9FFD016A9018D 0D38AD1
    63849018D1638         :REM*241
118 DATA 206A33204A334C083220 0
    533A92D2CA93A208C35 A006202
    A31A90820573 0        :REM*249
119 DATA A596D0EA206A33A004B1 6
    68D09382077 33A20520 C9FFA00
    0B16620D2FFC8          :REM*60
120 DATA CC0938D0F520CCFFA900 6
    0A92A208C35A006202A 31A9082
    0573 0A596D0ED        :REM*113
121 DATA A90A8D0938A00C202A31 A
    91020573 0A596F005CE 0938D0E
    DA9038D0938A0         :REM*236
122 DATA 0920 2A31A900205730CE 0
    938D0F1A90160A000A9 008D063
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```
    88D0738208136         :REM*230
123 DATA 20F830A596D03CAD0002 9
    90039C003B01C990038 C002D01
    5AD0038C941D0         :REM*224
124 DATA 0EAD0138C943D007AD02 3
    8C94BF00BC8CC0938D0 C2A9018
    59660A9FF8D06          :REM*34
125 DATA 388D07384C8F32EE0638 D
    003EE0738AD06380D07 38F01BA
    D0638C906AD07         :REM*179
126 DATA 38C910D09EA9028596C0 0
    0F004A90485964C6435 A908859
    660AD16384901         :REM*158
127 DATA 8D1638206A33A005AD19 3
    818690191 66C8AD1A38 6900916
    6A20220C6FFA0         :REM*238
128 DATA 0720CFFF9166C820B7FF D
    00ACC1838D0F098484C 4B33984
    8A005C8A9FF91         :REM*152
129 DATA 664C4B334820CCFF20A1 3
    5207F3520A135A004B1 668D093
    820773368A004         :REM*219
130 DATA 91662086336 0A9008566 A
    D16381869398567 60A9 008566A
    D163849011869          :REM*67
131 DATA 3985676 0A9008D12388D 1
    3388D14388D1538A004 AD12381
    871668D123890         :REM*208
132 DATA 03EE1338AD143851668D 1
    438AD15382A2E14382E 1538C8C
    C0938D0DAA000         :REM*121
133 DATA AD12389166C8AD133891 6
    6C8AD14389166C8AD15 3891666
    0A9008D0D388D         :REM*241
134 DATA 0C388D1D38A9018D1638 A
    9FF8D19388D1A382077 33A004A
    907916620 6A33         :REM*110
135 DATA A005A9009166C891662 0 B
    231F0FBA9008D000260 A9018D1
    938A9008D1A38         :REM*208
136 DATA 8D0D388D16388D05398D 0
    6398D0C38A9078D0439 A900204
    031AD0D38D0D2         :REM*194
137 DATA 208A34D03C20CCFFAD09 3
    8C907F016A20220C9FF A007B90
    03920D2FFC8CC         :REM*170
138 DATA 0938D0F420CCFFAD0639 C
    9FFD008A9018D0D38A9 2A2CA92
    D20D2FF20A135          :REM*91
139 DATA A9004C2E3420CCFFA93A 2
    0D2FFAD17388D0439A9 034C2E3
    4AD00398D0E38         :REM*135
140 DATA AD01398D0F38AD02398D 1
    038AD03398D11382 06A 33AD173
    88D0938208633         :REM*127
141 DATA AD0039CD0E38D01BAD01 3
    9CD0F38D013AD0239CD 1038D00
    BAD0339CD1138          :REM*98
142 DATA D003A90060A90160A900 8
    D19388D1A388D0D388D 16388D0
    C38A9071869 01          :REM*33
143 DATA 8D0439A900204031AD0D 3
    8D020208A34D010AD07 398D1B3
    8A9018D0D38A9         :REM*248
144 DATA 004CEF34AD17388D0439 A
    9034CEF34A9008D0002 60A9008
    D0D388D0C38A9         :REM*164
145 DATA 018D16388D1D38A9FF8D 1
    9388D1A38207733A004 A907186
    90191662 06A33          :REM*73
146 DATA A005A9FF9166C89166A0 0
    7AD1B389166A9018D1E 3820B23
    1F0FBA9008D00          :REM*13
147 DATA 0260EE0C38AD0C38C903 9
    00CA9008D0C38AD0B38 F007D01
    1AD0B38F00CA2          :REM*64
148 DATA 00A000C8D0FDE8E078D0 F
    66048AD19380D1A38F0 0AAD1D3
    8D00568 20D2FF         :REM*194
149 DATA 4868602 0C2E6AD0F0AC9 8
    0F0F6C992F0F2602 06D 3620F73
    0A596D014AD00         :REM*218
150 DATA 02297F8D0002C908F00B C
    90DF007C920100 34C1B 36C9619
    00DC97BB00938          :REM*47
151 DATA E9208D00024CF035C941 9
    00AC95BB0061869808D 0002C90
    8D005A9148D00          :REM*13
152 DATA 02C922D00A20D2FFA914 2
    0D2FFA922AD0002C90D D007A92►
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    020D2FFA90D20              :REM*166
153 DATA D2FF206D3620E4FFF093 8
    D0002C913F045C94190 0DC95BB
    0091869208D00              :REM*241
154 DATA 024C4936AD0002C9C190 0
    AC9DBB00638E9808D00 02C914D
    005A9088D0002              :REM*209
155 DATA C983D005A9108D0002A2 0
    520C9FFAD000220D2FF 20CCFF4
    CB03560A91220              :REM*137
156 DATA D2FFA9B820D2FFA99D20 D
    2FFA99220D2FFEAA5D3 C902D00
    768BAEC1C38D0              :REM*14
157 DATA F9A9018D000260AD2603 C
    9BAD007AD2703C936F0 16AD260
    38D023BAD2703              :REM*218
158 DATA 8D033BA9BA8D2603A936 8
    D27036048A59AC903D0 04686C0
    23B9004686C02              :REM*185
159 DATA 3B4A68859E8A48984890 2
    320BEE9D00E2015EAB0 0EA902A
    00091B2C884A6              :REM*196
160 DATA A59E91B21868A868AAA5 9
    E9002A900602001374C EC36201
    237AC1B0AC8CC              :REM*131
161 DATA 1A0AF0F48C1B0A88A59E 9
    1CAAD0F0A4AB01EA910 8D0EDDA
    D003B8D04DDAD              :REM*251
162 DATA 013B8D05DDA981207FE6 2
    04AE6A9118D0EDD6007 0000000
    000000033                  :REM*198
163 DATA -1                    :REM*17
```

Listing 4. RUN Term 128 Xmodem program.

```
10 OPEN 8,8,8,"WXMODEM128,P,W"
                           :REM*100
15 FAST                    :REM*86
20 READ A$:IF A$="-1" THEN CLOS
   E8:END                  :REM*176
25 IF LEN(A$)<62 THEN 55
                           :REM*232
30 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,29)      :REM*35
35 N=LEN(B$)/2             :REM*38
40 FOR I=1 TO N            :REM*20
45 H$=MID$(B$,I*2-1,2):H=DEC(H$
   )                       :REM*222
50 PRINT#8,CHR$(H);:NEXT:GOTO 2
   0                       :REM*100
55 IF LEN(A$)<20 THEN B$=A$:GOT
   O 70                    :REM*65
60 IF LEN(A$)<42 THEN B$=MID$(A
   $,1,20)+MID$(A$,22,(LEN(A$)-
   21)):GOTO 70            :REM*148
65 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,LEN(A$)-42)
                           :REM*80
70 N=LEN(B$)/2             :REM*67
75 FOR I=1 TO N            :REM*73
80 H$=MID$(B$,I*2-1,2):H=DEC(H$
   )                       :REM*251
85 PRINT#8,CHR$(H);:NEXT:GOTO 2
   0                       :REM*129
100 REM XMODEM PROTOCOL FOR RUN
    TERM128                    :REM*63
101 DATA 00284C30284CED2A0000 0
    0004000000000008000 000008
    4830000040043              :REM*146
102 DATA 43330000000000000001 0
    0000000000000000000 A9008D0
    F288D11288D1F              :REM*243
103 DATA 288D20288D2B288D2C28 8
    D2D288D2E288D14288D 2A28206
    C2E20E02DA980              :REM*102
104 DATA 8D1028A9008D13288D17 2
    88D182820E82920E1FF D0034CB
    22AAD1728D038              :REM*219
105 DATA AD0B28C904D0034C9C29 C
    918D00320B72AC916D0 034C5B2
    8C901D0D4A904              :REM*232
106 DATA 8D2528AD1428D00FAD29 2
    8C955F00820732DA955 8D2928A
    D0B2820BA2CCD              :REM*36
107 DATA 1528D0B0AD0104186D02 0
    418C9FFF006204F2A4C 5B28EE1
    428AD0104CD14              :REM*81
108 DATA 28F009CE1428204F2A4C 5
    B28AD0628C915F00D20 322E204
    92EC900D0E64C              :REM*8
109 DATA FD28AD182838ED830418 C
    D8304D0D6AD0628C957 D03A20F
    52EAD0A28C940              :REM*95
110 DATA F004C980F00B20A02A4C 1
    D29A90020732DEE2A28 AD2A28C
    904D014AD0A28              :REM*234
111 DATA C980D005A90720732DA9 0
    08D2A28203E2F4C5B28 AD0F28F
    042A000A204BD              :REM*8
112 DATA 8504DD1928D005CA10F5 A
    0068C0D28A20820C9FF AE0D28B
    D85042C072810              :REM*133
113 DATA 0320CE2920D2FF20B7FF D
    027EE0D28AD1028CD0D 28D0DF2
    C112810034CC8              :REM*245
114 DATA 2AA200BD03049D8504E8 1
    0F78E0F2820882A4C5B 2820B22
    AA9808D1128A2              :REM*18
115 DATA 7FAD2F28D00EBD85048D 1
    228C91AF007C900F003 4CC729B
    D8504CD1228D0              :REM*27
116 DATA 06CA10F54CC82AE88E10 2
    84C4329297FC9419013 C95BB00
    F09204CE729C9              :REM*198
117 DATA 619006C97BB00229DF60 2
    07C2C20E1FFF05C2067 2CD02AA
    D0928C980F007              :REM*39
118 DATA AD0628C957D01BAD0B28 C
    910D00C20E829AD0B28 49408D0
    B2860C911F0CE              :REM*229
119 DATA C913F0CA6020762C90C7 A
    D0628C957D01CA91820 832CA91
    820832C203E2F              :REM*212
120 DATA A91820832CA91820832C 6
    8684CE32A68684C5328 4CB22AE
    E1328A90ACD13              :REM*76
121 DATA 28F059AD0A28C940D006 2
    07C2A4C6B2AA9012073 2DAD062
    8C957D004200F              :REM*192 ►
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    8D003EE2E28206A2F60 AD0A28C
    940D00620A02A          :REM*89
123 DATA 4C9A2AA90020732DA906 2
    0832C60EE2B28D003EE 2C28206
    A2F60A9042083          :REM*209
124 DATA 2C60A91820832CA90420 E
    52A209F2D6868602903 20832C6
    0A90620832CAD          :REM*56
125 DATA 0628C957D00F20E829C9 0
    4D0F9A90620832C20BA 2EA9032
    0732DA9084CC3          :REM*100
126 DATA FF20E1FFD00320B72AAD 1
    90A8D180AA9008D1F28 8D20288
    D2B288D2C288D          :REM*53
127 DATA 2D288D2E28A9018D0004 8
    D010449FF8D020420E1 FFD0062
    0AC2A20B72A20          :REM*189
128 DATA 672CD0F0AD0B28C918D0 0
    320B72AC943F004C915 D0DE8D0
    628206C2EAD29          :REM*17
129 DATA 2820732DA9038D1728A2 0
    08E18288E0C2820E1FF D0034C2
    22C20CCFFA208          :REM*142
130 DATA 20C6FF20E4FF4820CCFF 6
    82C0728100320CE298D 0B2820B
    7FF29C38D0C28          :REM*248
131 DATA D00CAD0B2820BA2CC983 D
    0C9F02AAD0B2820BA2C CD1628F
    01FA91A8D1228          :REM*27
132 DATA AD0B28C91AD005A9008D 1
    228AD12288D0B2820BA 2CCD162
    8D0F8AD0628C9          :REM*110
133 DATA 15F00920322E205F2E4C D
    02BAD18288D8304A900 8D0D282
    0E1FFF048AE0D          :REM*13
134 DATA 28BD000420832CEE0D28 A
    D1528CD0D28D0E7207C 2C20672
    CF00C20E1FFF0          :REM*184
135 DATA 2720762C90F1B0B8AD0B 2
    8C915D015AD0A28C940 D006207
    C2A4CBA2BA901          :REM*203
136 DATA 20732D4CBA2BC918D003 2
    0B72AC906D0C8AD0A28 C940D00
    620A02A4C3B2C          :REM*188
137 DATA A90020732DAD0C28F019 2
    0AC2A207C2CA5A13005 20672CD
    0F7AD0C282940          :REM*22
138 DATA F0CC4CE32AEE0104A9FF 4
    D01048D02044C4A2BA2 0520C6F
    F20E4FF8D0B28          :REM*38
139 DATA 20B7FF60A5A1CD252860 A
    90085A185A26048A205 20C9FFA
    D0F0A2903D0F9          :REM*249
140 DATA 68A8AD0928C980D01C98 C
    910F00FC916F00BC911 F007C91
    3F0034CB52C49          :REM*40
141 DATA 40A8A91020D2FF9820D2 F
    F60AD0B28AE17289D00 04A8AD0
    628C915D00898          :REM*223
142 DATA 186D18288D1828EE1728 E
    88A60EF2CF32CF52C0A 2D1F2D3
    42D492DF12C5E          :REM*220
143 DATA 2D662D6F2D2D002B003A 0
    057584D4F44454D2050 524F544
    F434F4C202020          :REM*119
144 DATA 0D005452414E53464552 2
    0434F4D504C45544520 200D005
    452414E534645          :REM*222
145 DATA 522041424F5254454420 2
    0200D00584D4F44454D 2050524
    F544F434F4C20          :REM*58
146 DATA 2020200D004352432050 5
    24F544F434F4C202020 2020202
    00D00424C4F43          :REM*3
147 DATA 4B532000204552524F52 5
    3200020910D0048AD08 28F0026
    860A20320C9FF          :REM*16
148 DATA 680AAABDD92C85C3E8BD D
    92C85C4A000B1C3C900 F00820D
    2FFC8C000D0F2          :REM*0
149 DATA 60207C2C24A210FC60A9 0
    08D21288D2228A9108D 2328A92
    18D242860A208          :REM*212
150 DATA 4D21288D21280E22282E 2
    1289012AD23284D2128 8D2128A
    D24284D22288D          :REM*197
151 DATA 2228CAD0E360AD1428F0 0
    34C592AAD062820832C EE2728A
    D2728C903D039          :REM*34
152 DATA A9008D2728AD0628C957 D
    010A9068D2928A9438D 0628A90
    18D252860C943          :REM*1
153 DATA D019A9058D2928A9158D 0
    628A9038D2528A9848D 1528A98
    38D16286020A7          :REM*229
154 DATA 2DA200BD03048E272820 B
    A2DAE2728E8E080D0EF 60AD222
    8CD8404D00BAD          :REM*124
155 DATA 2128CD8304D003A90060 A
    90160AD21288D8304AD 22288D8
    4046020AA2EA9          :REM*179
156 DATA 008D2728A9858D1528A9 8
    48D1628A9018D2528AD 0628C95
    7D006A9028D29          :REM*205
157 DATA 2860C943D006A9068D29 2
    860A9058D2928A9848D 1528A98
    38D162860A985          :REM*163
158 DATA 858BA904858C60E68BD0 0
    2E68C60A58BC985D007 A58CC90
    4D00160A58B8D          :REM*168
159 DATA 0D28A58C8D0E28A20820 C
    9FF20AA2EA000B18B20 D2FF20B
    32EA58BCD0D28          :REM*202
160 DATA D0EFA58CCD0E28D0E820 A
    A2E60A000B903042C07 2810032
    0CE29A200818B          :REM*188
161 DATA 20B32EC8C080D0E96020 A
    A2EA9018D2528207C2C 20672CF
    0FB20762C90F6          :REM*143
162 DATA A9048D2528AD142838ED 2
    A288D1428A91520832C A90120C
    22A6020BA2EA9          :REM*182
163 DATA 0620832CA90020C22AA9 0
    620832CA90220C22AA9 0620832 ►
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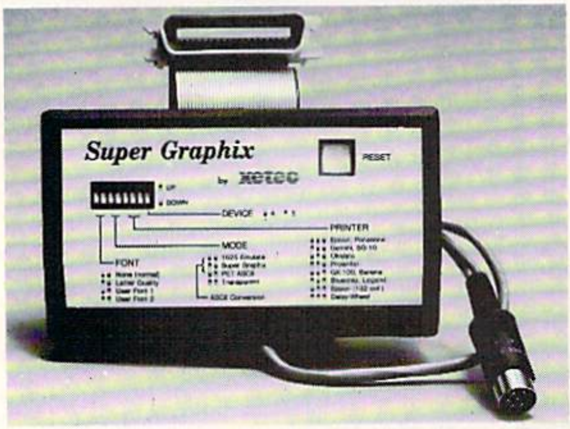

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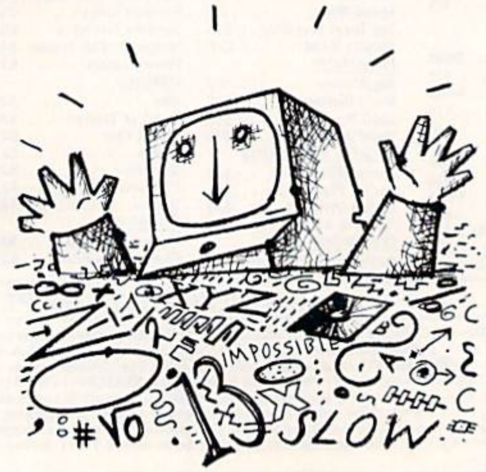
Circle 136 on Reader Service card.

RUN TERM 128

```
    CA90220C22AA9          :REM*89
164 DATA 0620832CA90020C22A60 A
    90820732DA203869AAE 2B28AD2
    C2820328EA909          :REM*36
165 DATA 20732DAE2D28AD2E2820 3
    28EA90A20732D60       :REM*108
166 DATA -1                :REM*20
```

Listing 5. RUN Term 128 Tables program.

```
10 OPEN 8,8,8,"TABLES,P,W"
                           :REM*46
15 FAST                    :REM*86
20 READ A$:IF A$="-1" THEN CLOS
   E8:END                 :REM*176
25 IF LEN(A$)<62 THEN 55
                          :REM*232
30 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,29)      :REM*35
35 N=LEN(B$)/2             :REM*38
40 FOR I=1 TO N            :REM*20
45 H$=MID$(B$,I*2-1,2):H=DEC(H$
   )                      :REM*222
50 PRINT#8,CHR$(H);:NEXT:GOTO 2
   0                      :REM*100
55 IF LEN(A$)<20 THEN B$=A$:GOT
   O 70                    :REM*65
60 IF LEN(A$)<42 THEN B$=MID$(A
   $,1,20)+MID$(A$,22,(LEN(A$)-
   21)):GOTO 70           :REM*148
65 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,LEN(A$)-42)
                           :REM*80
70 N=LEN(B$)/2             :REM*67
75 FOR I=1 TO N            :REM*73
80 H$=MID$(B$,I*2-1,2):H=DEC(H$
   )                      :REM*251
85 PRINT#8,CHR$(H);:NEXT:GOTO 2
   0                      :REM*129
100 REM REQUIRED TABLES FOR RUN
    TERM128               :REM*115
101 DATA 000E000102030405060 7 0
    8090A0B0C0D0E0F1011 1213081
    5161718191A1B         :REM*135
102 DATA 1C1D1E1F202122232425 2
    62728292A2B2C2D2E2F 3031323
    3343536373839         :REM*122
103 DATA 3A3B3C3D3E3F40616263 6
    465666768696A6B6C6D 6E6F707
    1727374757677         :REM*232
104 DATA 78797A5B5C5D5E5F0000 0
    0000000000000000000 0000000
    0000000000000         :REM*197
105 DATA 00000000007B7C7D7E00 0
    0000000000000000000 0000000
    0000000000000         :REM*179
106 DATA 00000000000000000000 0
    0000000000000000000 007C000
    0000000000000         :REM*191
107 DATA 00000000000000000000 0
    0000000604142434445 4647484
    94A4B4C4D4E4F         :REM*162
108 DATA 50515253545556575859 5
    A7B7C7D7E0000000000 0000000
    0000000000000         :REM*196
109 DATA 00000000000000000000 0
    000007B7C7D7E000000 0000000
    5000714090A00         :REM*157
110 DATA 0C0D0000001100131400 0
    000000001B000000000 2021222
    3242526272829         :REM*171
111 DATA 2A2B2C2D2E2F30313233 3
    435363738393A3B3C3D 3E3F40C
    1C2C3C4C5C6C7         :REM*140
112 DATA C8C9CACBCCCDCECFD0D1 D
    2D3D4D5D6D7D8D9DA5B 5C5D5E5
    F6041424344 45         :REM*31
113 DATA 464748494A4B4C4D4E4F 5
    0515253545556575859 5A7B7C7
    D7E1400000000         :REM*129
114 DATA 0005000714090A000C0D 0
    0000091000000000000 0000001
    B000000002021          :REM*38
115 DATA 22232425262728292A2B 2
    C2D2E2F303132333435 3637383
    93A3B3C3D3E3F          :REM*98
116 DATA 40C1C2C3C4C5C6C7C8C9 C
    ACBCCCDCECFD0D1D2D3 D4D5D6D
    7D8D9DA5B5C5D         :REM*183
117 DATA 5E5F6041424344454647 4
    8494A4B4C4D4E4F5051 5253545
    5565758595A7B         :REM*125
118 DATA 7C7D7E14         :REM*227
119 DATA -1               :REM*230 ■
```



From p. 16.

$463 How Many Colors, Commodore?

Everyone knows the C-64 and C-128 offer only 16 colors. My program creates practically every color in two or three shades. Try it on your C-64 or C-128. You'll be surprised that no one has discovered this trick before now!

```
0 REM HOW MANY SCREEN COLORS? - AL SPEICHE
  R                                  :REM*5
10 PRINT"{SHFT CLR}":T=1           :REM*164
20 Q$="{2 COMD Gs}{2 SHFT Ts}{SHFT G}{2 SH
   FT Bs}{SHFT H}{SHFT Y}{3 COMD Ms}{SHFT
   Y}{SHFT H}{2 SHFT Bs}{SHFT G}{SHFT T}{C
   OMD G}":Q$=Q$+Q$:POKE53281,T-1:POKE5328
   0,T-1                            :REM*18
30 T=T+1:POKE646,T:FOR S =1 TO 50:Q$=MID$(
   Q$,2,55)+LEFT$(Q$,1)            :REM*226
40 PRINTQ$:NEXT                     :REM*68
50 GOTO 20                         :REM*174
```

—Al Speicher, Saline, MI

$464 Lou's Sequential Saga

If you want to convert a Basic program on disk into a sequential file for reading it unaltered into a word processor or terminal program, use this one-liner:

```
OPEN 8,8,8,"FILENAME,S,W":CMD8:LIST:PRINT#8:CLOSE8
```

Enter it in Direct mode and be sure you already have a program in memory.

—Louis Wallace, *RUN* Staff

$465 C-64 Sequential Directory Creator

My program, Sequential Directory Creator, is an alternative to Lou's Sequential Saga. Suppose you want filenames from disk directories incorporated into word processors in text form. Run my program once for every disk you want to capture filenames from, and it will automatically create a sequential file of each disk's directory.

A write-protect tab cannot be on the disk to be cataloged, because the filename you enter at the first prompt will be written to disk as a sequential file that contains all the filenames from that disk. After running my program and creating a sequential file of the directory, simply read that file into your word processor.

```
10 REM SEQUENTIAL DIRECTORY - AL FORTIER
                                   :REM*245
20 PRINT"{SHFT CLR}INSERT DISK TO READ"
                                   :REM*172
30 INPUT"{CRSR DN}ENTER A FILENAME FOR THE
   DISK";F$                        :REM*233
40 DIMD$(144):OPEN1,8,0,"$0"        :REM*73
50 GET#1,A$,A$                     :REM*241
60 GET#1,A$,A$:IFA$=""THEN CLOSE1:GOTO 120
                                   :REM*183
70 GET#1,A$,B$                      :REM*28
80 C$=MID$(STR$(ASC(A$+CHR$(0))+ASC(B$+CHR
   $(0))*256),2)+CHR$(32)          :REM*145
90 GET#1,A$:IFA$=""THEN 110         :REM*82
100 D$(I)=D$(I)+A$:GOTO 90         :REM*210
110 D$(I)=C$+D$(I):PRINTD$(I):I=I+1:GOTO 6
    0                              :REM*196 ►
```

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```
120 OPEN 2,8,2,F$+",S,W"                 :REM*176
130 FORJ=0 TO I-1                        :REM*131
140 PRINT#2,D$(J):NEXT                    :REM*35
150 CLOSE 2:END                           :REM*76
```

—Al Fortier, Boise, ID

$466 ALTernative Reset

Are you tired of resetting your C-128 with the reset button? My program literally provides an ALT-ernative by letting you press the ALT key at the top of the keyboard to accomplish the same thing. Type in the program and save it to disk before running it. When you run it, pressing the ALT key in 128 mode resets the system. You can use run-stop/restore to disable it and the F4 key or SYS 4864 to re-enable it.

```
0 REM ALT RESET - NELSON SEARCY       :REM*144
10 KEY 4,"BANK15:SYS4864"+CHR$(13):REM*211
20 FOR B= 4864 TO 4892:READ K$:A=DEC(K$):C
   =C+A:POKEB,A:NEXT:IF C<>2566 THEN PRINT
   "ERROR IN DATA":END                 :REM*177
30 BANK 15:SYS4864                     :REM*121
40 DATA 78,A9,D,8D,14,3,A9,13,8D,15,3,58,6
   0,AD,D3,0,C9,8,F0,3,4C,65,FA,4C,0,E0,0,
   0,0                                 :REM*151
```

—Nelson Searcy, Forest City, NC

$467 Control-G on the 64

Most C-128 owners know that if they press control-G on their computers, it rings the C-128's ROM bell. My little routine gives the C-64 a control-G key combination that sounds identical to the C-128's bell.

```
0 REM C128 BELL FOR THE C64 - BARBARA SCHU
  LAK                                   :REM*199
10 PRINT"{SHFT CLR}PRESS CTRL-G TO HEAR TH
   E C-128'S BELL."                     :REM*241
20 GET K$: IFK$<>"{CTRL G}" THEN 20 :REM*0
30 GOSUB 50                             :REM*164
40 GOTO 20                              :REM*164
50 V=54273:POKEV+23,21:POKEV+4,9:POKEV+5,0
   :POKEV,48:POKEV+3,32:POKEV+3,33:REM*209
60 RETURN                               :REM*202
```

—Barbara Schulak, Pepper Pike, OH

$468 Wear-'n'-Tear Saver

When I need to leave my computer for a while, I use my Magic trick, Wear-'n'-Tear Saver, to minimize stress on computer peripherals by keeping them cool when they're not in use. And it saves electricity, as well.

When I want to stop working at my computer for a while, I save my work, turn off the video monitor, remove the disk and turn off the drive. Of course, I always leave the computer on.

When I return, I just turn on the monitor, and my video display instantly appears with the cursor located right where I left it. I then switch on the disk drive, pop in my work disk, initialize it and resume working.

—Alf, Melmac ■

Magic is the original *column of reader-submitted hints and tips. Each month we present brief, useful computer tricks to help you get the* *most out of your Commodore system—whether you're a beginning or advanced computerist, a C-64 or C-128 owner. Magic is a forum for* RUN*'s imaginative and inventive readers to share their programming tips, brief software or hardware modifications, shortcuts or items of general interest. If you have an idea to make computing easier, faster, more exciting and enjoyable, send it to:*

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RUN *pays $10 to $40 for each trick published in the column. A payment of $50 and a Magic Contributor T-shirt is awarded for the Trick of the Month. To be eligible, the Trick of the Month must be for the C-64 or the C-64 and C-128. Tricks for C-128 mode only are not eligible for Trick of the Month.*

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MEGA-MAGIC

Protect your monitor from screen burn.

BLANK-IT! 64

A monitor screen at a computer-controlled radio station in my home town is permanently damaged by "screen burn," a condition caused by leaving unchanging data on the screen for long periods of time, which literally burns into the screen. Normally, screen burn can be prevented simply by turning down the brightness of the monitor, regularly changing the screen display or turning the monitor off when not in use.

Sometimes, however, you find you need an extended screen display, and these methods won't work. So I wrote Blank-it!, an extension of the normal C-64 interrupt request (IRQ) routine that blanks the screen about three minutes after the last keypress. Pressing a key brings back the display just as you left it.

The program has three small, machine language routines in the top 134 bytes of the cassette buffer. The first routine installs the program as part of the IRQ routine and is activated by the SYS 890 command. Next, a second routine counts the minutes and blanks the screen. A third routine deactivates Blank-it! with SYS 1009.

After you've saved Listing 1 to disk, place a work disk in the drive, load Blank-it! with "BLANK-IT 64(890)",8,1 and run it with SYS 890 to save a one-block machine language file to your disk.

Once the program is activated, you may change the time between screen blanks by typing in POKE 948,X, where X may range from 1 (a four-second interval) to 43, the de-

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fault value (about three minutes). Enter SYS 1009 to disable Blank-it!.

Next month, Mega-Magic will feature a C-128 version of Blank-it!. R

—ROBERT DAVIS, SALINA, KS

Listing 1. Blank-it! 64 program.

```
10 REM BLANK-IT 64 BY ROBERT V. DAVIS
                                 :REM*51
20 PRINTCHR$(147)CHR$(142)        :REM*0
30 PRINT"FILE WRITER FOR BLANKIT.":REM*166
40 PRINT"INSERT FORMATTED WORK DISK"
                                :REM*237
50 PRINT"THEN PRESS RETURN."    :REM*128
60 GETK$:IFK$<>CHR$(13)THEN60    :REM*48
70 PRINTCHR$(17);"WORKING"      :REM*243
80 OPEN5,8,2,"0:BLANK-IT 64(890),P,W"
                                 :REM*77
90 PRINT#5,CHR$(122);CHR$(3);   :REM*110
100 FORX=1TO134                 :REM*197
110 READY:PRINT#5,CHR$(Y);      :REM*175
120 NEXTX                       :REM*171
130 CLOSE5                      :REM*141
140 PRINTCHR$(17);"{SHFT CLR}NOW LOAD BLAN
    K-IT 64(890),8,1"           :REM*132
150 PRINTCHR$(17);" SYS 890 TO ACTIVATE -
    SYS 1009 TO STOP"           :REM*210
160 DATA 120,173,20,3,172,21,3,141,238,3,1
    40,239,3,169,155,160,3,141,20,3
                                :REM*176
170 DATA 140,21,3,169,0,141,236,3,141,237,
    3,88,96,173,17,208,41,16,240,43:REM*16
180 DATA 165,203,201,64,208,57,238,236,3,2
    08,3,238,237,3,173,237,3,201,43:REM*46
190 DATA 208,50,173,32,208,141,240,3,169,0
    ,141,32,208,173,17,208,41,239 :REM*196
200 DATA 141,17,208,108,238,3,165,203,201,
    64,240,22,173,240,3,141,32,208:REM*238
210 DATA 173,17,208,9,16,141,17,208,169,0,
    141,236,3,141,237,3,108,238,3,2
                                :REM*213
220 DATA 0,49,234,254,120,173,238,3,172,23
    9,3,141,20,3,140,21,3,88,96 :REM*143 ■
```

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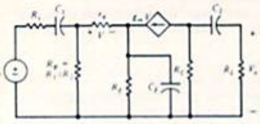

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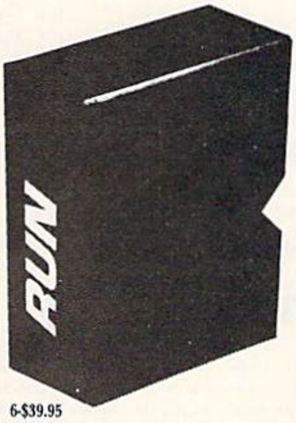

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A BETTER BACKUP–

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HEARTY GREETINGS–

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INVESTMENT SOFTWARE–

If last October gave you the willies, now, more than ever, you want to pick winning stocks and keep careful track of your investment transactions. Next month, we'll provide a roundup of software that will help. And, for the less adventuresome, we'll survey simulation programs that let you play Wall Street tycoon without taking any risk.

INDEX REVISITED–

Due to space constraints in this issue, we were unable to include the 1987 *RUN* Index. Next month, we plan to bring you this list of all the articles and reviews we published last year.

REGULAR FEATURES–

Also watch for our many columns and departments, packed with interesting and useful Commodore computing information.

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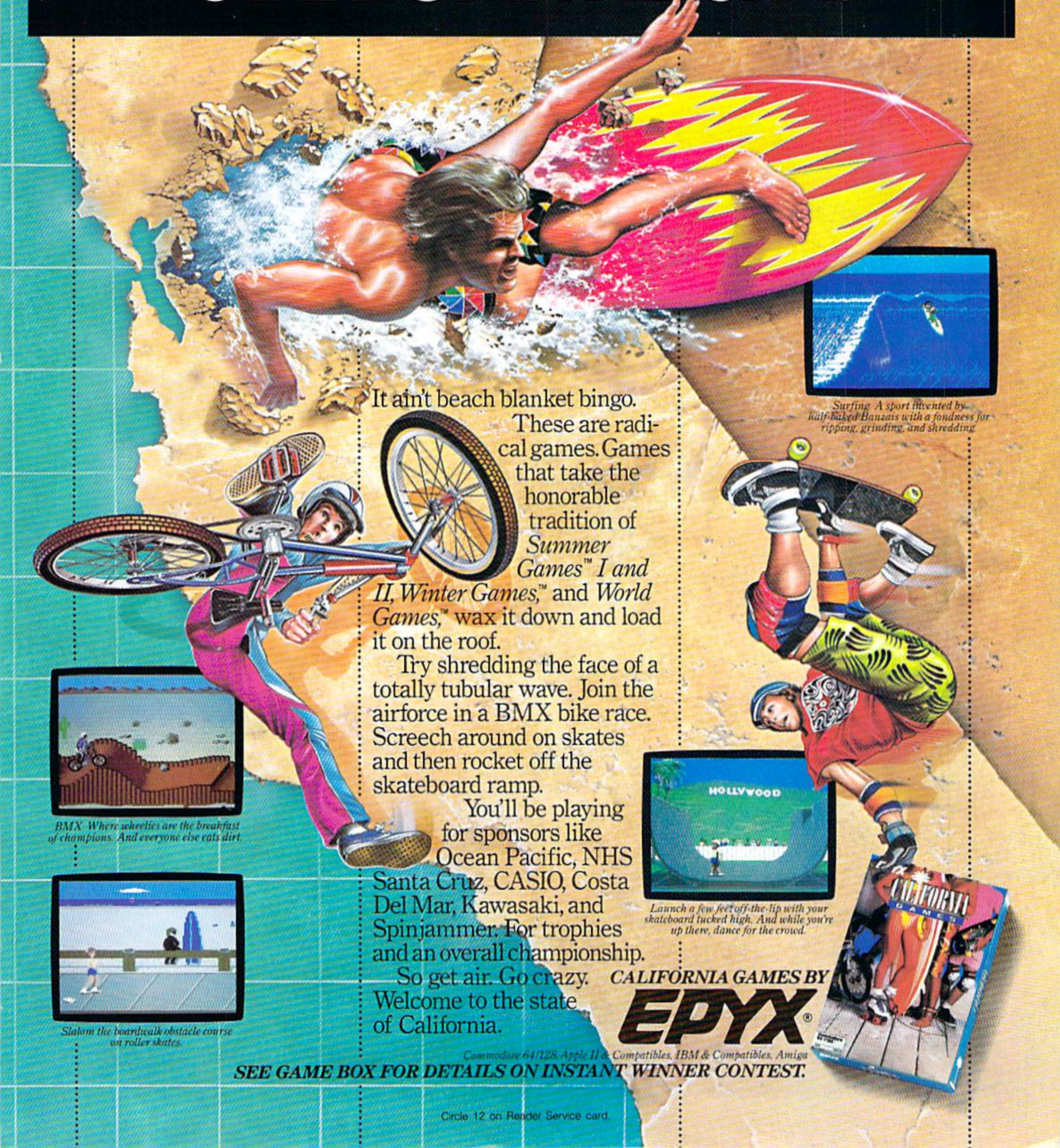

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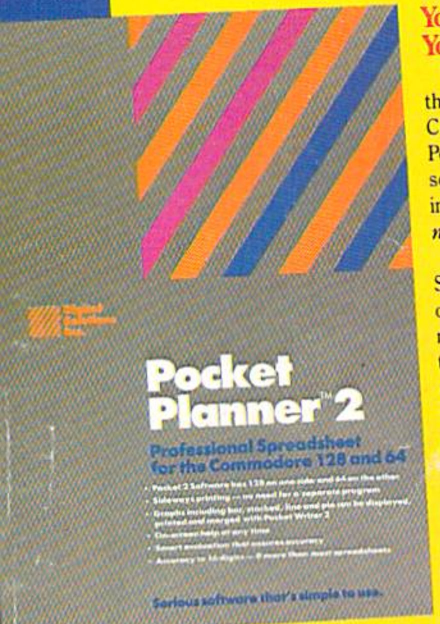
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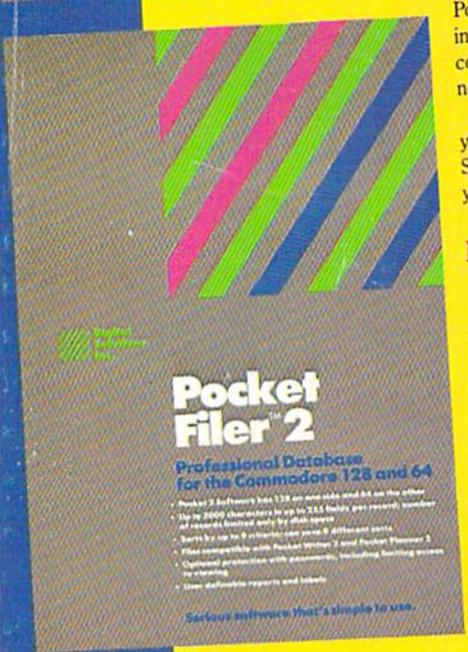
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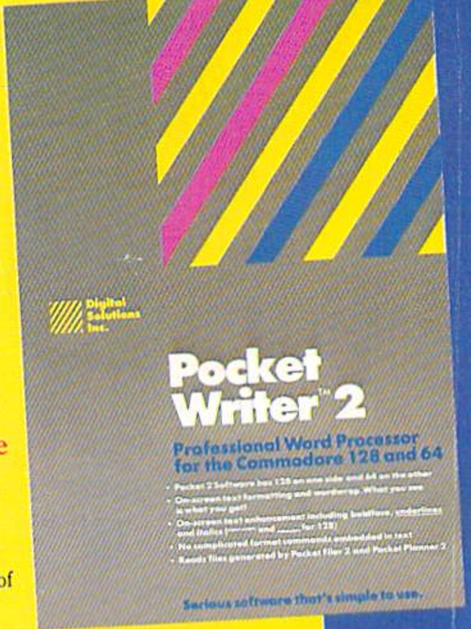
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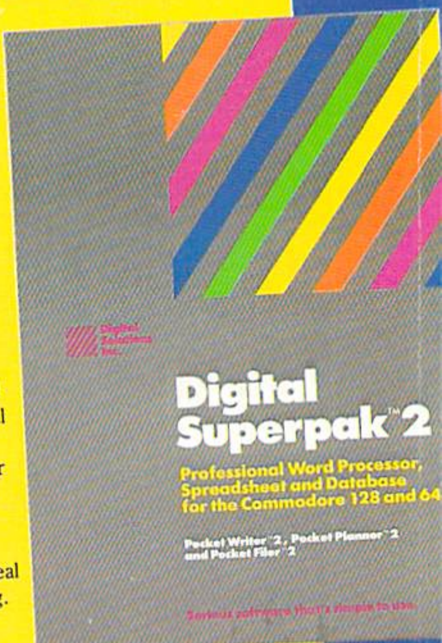
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